
Draft

Benthic Study Report, Solid Waste Management Unit (SWMU) No. 5 Cooling Water Canal

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Acronyms and Abbreviations

CWC	Cooling Water Canal
EPA	U.S. Environmental Protection Agency
ER-L	Effects Range-Low
ER-M	Effects Range-Medium
ESB	Equilibrium Partitioning Sediment Benchmark
ESBTU	Equilibrium Partitioning Sediment Benchmark Toxicity Unit
ESV	Ecological Screening Value
IDW	investigation-derived waste
m ²	square meter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NOAA	National Oceanic and Atmospheric Administration
NTU	nephelometric turbidity unit
PAH	polycyclic aromatic hydrocarbon
ppt	parts per thousand
PTPLLC	Peñuelas Technology Park LLC
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
s.u.	standard unit
TOC	total organic carbon
°C	degrees Celsius

SECTION 1

Introduction

This report presents the results of a comparative assessment of sediment chemistry and benthic invertebrate communities in the Cooling Water Canal (CWC) and background locations at Peñuelas Technology Park LLC (a wholly-owned subsidiary of The Dow Chemical Company), located in Peñuelas, Puerto Rico. The basis of conducting this study is the finding identified in the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) (CH2M HILL, 2012) that the concentrations of polycyclic aromatic hydrocarbons (PAHs) in the sediments in the northern half of the CWC could pose an elevated risk to directly exposed benthic invertebrates. Figure 1 shows the project location. This study was conducted in accordance with the Technical Memorandum *Sampling and Analysis Plan, Benthic Study for Cooling Water Canal Sediments (SWMU No. 5)* (CH2M HILL, 2013), which was submitted to the U.S. Environmental Protection Agency (EPA) Caribbean Environmental Protection Division in May 2013. These results provide additional site-specific data for evaluation and refinement of the remedial options for the CWC.

Comments from EPA on the Sampling and Analysis Plan were received February 4, 2014. Since the benthic study field investigation was conducted in May 2013, agency-suggested changes were not incorporated into the plan. However, this report includes discussion to address EPA comments, as appropriate.

1.1 Benthic Study Goal

Previous investigations of potential ecological risk, as summarized in the RFI, have identified sediment concentrations of PAHs in the CWC which exceed marine sediment ecological screening values, thus indicating a potential for adverse effects to the benthic community. Figure 2 illustrates the RFI determinations of potential risk to benthic organisms at each of the stations, including exposure to surface sediment and subsurface sediment. Surface sediment samples having hazard quotients (based on PAHs) at a frequency and/or magnitude indicative of potential adverse effects occurred northward of Station 21+00 of the CWC, while all surface sediment south of Station 21+00 and extending downstream to Tallaboa Bay are likely to pose negligible risk to benthic invertebrates. Samples from five stations scattered within the northern section of the CWC also indicated negligible potential for risk. Surface sediment PAH concentrations throughout the lower section of the CWC, represented by samples from Transects 22, 24, 26, and Station S1, are likely to pose negligible risk to benthic organisms. This conclusion is based on results for several parameters indicating PAH concentrations either less than or comparable to reference station concentrations, low magnitude of exceedances of the Effects Range-Low (ER-L) screening values for parameters detected at concentrations similar to or greater than reference station concentrations, and the evaluation of equilibrium partitioning-based screening results. Overall, surface sediment contamination at concentrations that could pose potential risk to benthic invertebrates appears to occur northward of Station 21+00 of the CWC.

The actual effect of elevated PAH concentrations on the benthic community within the CWC was not directly measured as part of the RFI. Therefore, the goal of this benthic study was to quantitatively measure the benthic community existing at multiple surface sediment locations within the CWC to determine whether measurable adverse impacts are occurring in association with elevated PAH concentrations. Benthic community measurements at “background” locations were also performed for comparison. This report presents the results of an evaluation of these site-specific and background benthic data along with collocated sediment chemistry, physical characteristics, and overlying water quality data to estimate the extent, or lack thereof, of biological impairment in the CWC directly related to sediment PAH contamination.

1.2 Sampling Locations

Sediment and benthic community samples were collected at fifteen (15) locations in the CWC, two (2) background locations at the mouth of the CWC, and two (2) background locations in a mangrove embayment west of the Puntilla area (Figures 3 and 4).

The identification of appropriate background locations for this study was complicated by the fact that the CWC provides a unique aquatic habitat considering: 1) it is a man-made linear canal, 2) is closed at the northern end and therefore has no continuous stream flow (other than daily tidal fluctuations), 3) is relatively deep ranging from less than 5 feet near the north end to about 20 feet at the mouth end, and 4) has fine silty-clay sediment throughout. Originally, six (6) background stations were considered including two (2) at the mouth of the CWC, two (2) at the disconnected CWC intake segment located approximately 2,500 feet east of the CWC, and two (2) at a nearby mangrove embayment west of the Puntilla area on the PTPLLC facility. No other suitable background locations were identified in the area of Tallaboa and Guayanilla Bays.

A preliminary site visit to the CWC intake segment determined that this segment was completely blocked from the ocean by accumulated sand at the mouth, and was a stagnant, relatively shallow channel that would not provide habitat conditions comparable to the CWC; therefore, this potential background location was removed from the sampling and analysis plan (SAP). As is described in this benthic study report, an evaluation of total organic carbon (TOC) and particle size at the four remaining background stations found that the two background stations at the mouth of the CWC were the only ones comparable to the benthic study stations within the CWC, and therefore were the only stations determined suitable for background evaluations of benthic community metrics.

1.3 Sampling Procedures

A SAP (CH2M HILL, 2013) was prepared to address sampling rationale and methods, analytical methods and quality control (QC), investigation-derived waste (IDW) management, and proposed reporting. Sampling involved the collection of benthic macroinvertebrate organisms, sediment chemistry, sediment physical characteristics, and field water quality data as follows:

1. Benthic macroinvertebrate samples were collected from the CWC at multiple locations shown on Figures 3 and 4. Locations were selected to represent the estimated range of sediment PAH concentrations in the CWC, as well as the gradient of natural environmental conditions such as canal depth, sediment physical characteristics, and water quality. Benthic macroinvertebrate samples were also collected from background locations to represent a similar range of environmental conditions in the CWC but without the influence of sediment PAH contamination. Benthic macroinvertebrate samples were collected with a Ponar dredge from the upper 6 inches of the sediment profile, in triplicate at each location.
2. Sediment samples were collocated with all benthic macroinvertebrate samples, and were collected from the upper 6 inches of the sediment profile. Analytical parameters included PAHs, and physical parameters included particle size and TOC.
3. Water quality was evaluated to assess water column characteristics at multiple locations within the CWC and background locations. Parameters included field-measured dissolved oxygen, temperature, pH, salinity, and turbidity, measured at 1-meter intervals within the water column.

SECTION 2

Test Results

2.1 Sediment Chemistry

Sediment chemistry results include concentrations of individual PAH compounds and total PAHs. Sediment particle size and TOC were also analyzed. Results for these parameters are presented in Table 1. Samples were analyzed for 18 PAHs, and each PAH was detected in one or more samples. The analytical results were also grouped and reported as total high molecular weight PAHs, total low molecular weight PAHs, and total PAHs. The chemistry data laboratory analytical report is provided in Appendix A, and the data validation report is provided in Appendix B.

2.2 Surface Water Quality

Field measurements of total depth, temperature, salinity, conductivity, dissolved oxygen, oxygen saturation, pH, and turbidity were collected at representative locations along the CWC and background areas, and are summarized in Table 2.

2.3 Benthic Invertebrate Communities

Benthic macroinvertebrates were identified in the laboratory to the lowest practical taxonomic level. Taxonomic results, as presented in Table 3, include the determination of multiple community indices such as the following:

- Total individuals and estimated density (individuals per square meter)
- Number of taxa
- Species diversity
- Species evenness
- Species richness
- Feeding guilds
- Pollution tolerance
- Raw species data

The taxonomic laboratory report is provided in Appendix C.

2.4 Data Evaluation and Comparative Assessment

A weight of evidence evaluation was conducted that included the assessment of sediment PAH concentrations, sediment physical characteristics, benthic invertebrate communities, and water quality. The objective was to determine what relationships can be identified among chemical, physical, and biological measures and whether adverse impacts to the benthic community directly associated with PAH contamination are occurring in the CWC.

2.4.1 Sediment PAHs

PAHs were detected at varying concentrations and frequencies at all CWC and background locations (Table 1).

- Total PAH concentrations in the CWC are highest at the upgradient (northern) end and significantly decline in the downgradient (southern) direction, ranging from 190.4 to 2.8 milligrams per kilogram (mg/kg) (Figure 5).

- Background total PAH concentrations were lower, ranging from an average of 0.2 mg/kg at background locations BKG-1 and BKG-2 (BKG 1/2 area) at the end of the CWC, to 0.1 mg/kg at background locations BKG-3 and BKG-4 (BKG 3/4 area) in the mangrove embayment.

2.4.2 Initial Screening of PAH Risk to Benthic Organisms

The PAH concentrations were compared to marine sediment ecological screening values (ESVs) in Table 1 to identify hypothetical risk and the need for further evaluation. Available ESVs were generally based on two approaches. The first approach relied on studies that correlate chemical concentrations in sediment with some measure of benthic community impairment. For this approach, the ESVs used for screening PAHs are ER-L and effects range-median (ER-M) as published by the National Oceanic and Atmospheric Administration (NOAA) (Buchman, 2008). The ER-L corresponds roughly to a 10 percent likelihood of the contaminant in sediment being toxic, while the ER-M corresponds roughly to a 50 percent likelihood of the contaminant in sediment being toxic. As discussed in the Final RFI for SWMU No. 5 (CH2M HILL, 2012), it is reasonable to focus on the less conservative ESV (the ER-M) to provide a more realistic estimate of potential risk to benthic organisms in the CWC. Using this approach, the following results were noted:

- Surface sediment concentrations exceeding ESVs at a frequency and/or magnitude indicative of potential adverse effects to benthic organisms occurred at locations from Transects 4 through 14.
- At Transects 12 and 14, where sediment samples were collected to represent the eastern and western halves of the transects, potential risk to benthic organisms only occurred at the western stations (T12-1 and T14-1); therefore the potential for adverse effects is considered negligible at the eastern stations (T12-3 and T14-3). Based on sediment chemistry and conservative screening criteria, the area of Transects 12 and 14 represent a transitional zone from potential risk to benthic organisms to negligible risk.
- For comparison, the RFI had identified potential risk to benthic invertebrates to occur over a greater distance, from the northern end of the CWC through Transect 20. The RFI had considered PAH data from surface sediment samples collected from varying depth intervals including 0-0.5 feet, 0-1.0 feet, and 0-2.0 feet. The current study only collected and evaluated surface sediment from the 0-0.5-foot interval, consistent with the typical biologically active zone in sediment and with the actual benthic macroinvertebrate samples collected.

The second ecological screening approach considered site-specific bioavailability of PAHs as affected by sediment TOC. The specific equilibrium partitioning methodology applied is consistent with that used in the RFI, which followed the EPA guidance document, *Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures* (EPA, 2003). The approach results in calculation of an Equilibrium Partitioning Sediment Benchmark Toxic Unit (ESBTU) (Table 4). Sediments containing ESBTU values less than or equal to 1.0 are acceptable for the protection of benthic organisms; if the ESBTU value is greater than 1.0, sensitive benthic organisms may be unacceptably affected. Results from this approach are as follows:

- Surface sediment sample locations with ESBTU values greater than 1.0 occurred at Transects 4 through 14, 18, and 20. ESBTU values above 1.0 ranged from 1.1 to 27.3.
- At Transects 12, 14, and 20, where sediment samples were collected to represent the eastern and western halves of the transect, ESBTU values greater than 1.0 only occurred at the western stations (T12-1, T14-1, and T20-1); ESBTU values less than 1.0 occurred at the eastern stations (T12-3, T14-3, and T20-3). This pattern is similar to that described previously for ESV exceedances.
- At Transect 18, ESBTU values were greater than 1.0 at the eastern and western stations, ranging from 1.4 to 2.9, respectively.

2.4.3 Sediment Physical Characteristics

Physical sediment characteristics measured included TOC and particle size, and are summarized in Table 1. Key observations included the following:

- TOC at the CWC sampling locations ranged from 1.6 to 4.5 percent, and averaged 2.5 percent. This is comparable to the 3.2 to 3.7 percent TOC range at the BKG 1/2 area at the end of the CWC. The BKG 3/4 area in the mangrove embayment had much higher TOC, ranging from 12.2 to 13.1 percent.
- Sediment throughout the CWC was predominantly silt (average 59 percent) and clay (average 27 percent), with percent fines (silt plus clay) ranging from 48 to 99 percent and averaging 86 percent. This is comparable to the BKG 1/2 area at the end of the CWC, which averaged 97 percent fines. Percent sand ranged from an average of 14 percent in the CWC to 3.5 percent at the BKG 1/2 area. The BKG 3/4 area in the mangrove embayment had less fines (average 62 percent) and greater sand (average 36 percent).
- No distinctive trends in TOC or particle size were evident within the CWC.

2.4.4 Surface Water Quality Characteristics

Surface water quality characteristics measured included temperature, salinity, conductivity, dissolved oxygen, dissolved oxygen percent saturation, pH, and turbidity. Results are summarized in Table 2. Overall, water quality conditions in the CWC were comparable to the BKG 1/2 and BKG 3/4 areas. Specific observations were as follows:

- Temperature, salinity, and pH exhibited little variation within the CWC, or differences relative to the BKG 1/2 area. Average temperatures (all depths) for the CWC and BKG 1/2 area were both 28.4 degrees Celsius (°C). Average salinities for the CWC and BKG 1/2 area were 36.9 parts per thousand (ppt) and 37.2 ppt, respectively. Surface water pH ranged from 7.7 to 7.9 standard units (s.u.) in the CWC, and was 7.9 s.u. across the entire water column at the BKG 1/2 area.
- Dissolved oxygen in the CWC (all depths) ranged from 3.03 to 4.70 milligrams per liter (mg/L), and was relatively similar to the BKG 1/2 area where dissolved oxygen ranged from 3.84 to 4.25 mg/L. Corresponding percent saturation ranged from 48.2 to 74.4 percent for the CWC, and 62.5 to 67.2 percent at the BKG 1/2 area.
- Dissolved oxygen was slightly lower at Transects 4 and 8 near the northern end of the CWC, with water column averages of 3.28 and 3.92 mg/L, respectively; downgradient measurements ranged from 4.11 to 4.33 mg/L.
- Bottom water column dissolved oxygen concentrations, which better represent conditions at the sediment surface where benthic macroinvertebrate communities occur, were relatively comparable to surface and mid-depth measurements, ranging from 3.75 to 4.70 mg/L in the CWC and measured at 4.25 mg/L at the BKG 1/2 area.
- Turbidity, measured at the water surface, was slightly higher at Transects 4 and 8 (range of 5.07 to 5.76 nephelometric turbidity units [NTUs]) compared to downgradient CWC locations (range of 2.87 to 3.90 NTUs). Turbidity at the BKG 1/2 area was 3.65 NTUs. Turbidity at the BKG 3/4 area in the mangrove embayment averaged 2.82 NTUs.

2.4.5 Benthic Macroinvertebrate Community Characteristics

The benthic macroinvertebrate community results are presented in Table 3 and represent pooled data from the three replicate samples collected at each location. Notable results were as follows:

- The number of taxa per location in the CWC ranged from 5 to 24, comparable to the range measured at the BKG 1/2 area (8 to 21) and generally higher than the range at the BKG 3/4 area (5 to 8) (Figure 6).

- The density of organisms per location in the CWC ranged from 230 to 3,491 per square meter (m^2), with highest densities (1,710 to 3,491 per m^2) occurring at the downgradient end of the CWC at transects 18 and 20 (Figure 3). Average density in the CWC (1,259 per m^2) is within the BKG 1/2 area range of 704 to 3,103 per m^2 , but slightly less than that of the BKG 3/4 area (1,379 to 1,868 per m^2).
- The lowest numbers of taxa occurred at CWC Stations T06-2, T14-3, and T16-3 (ranging from 5 to 9), but these numbers are comparable to background locations BKG-1, BKG-3, and BKG-4 (ranging from 5 to 8), although lower than BKG-2 (which had 21 taxa). Typically, a low number of taxa combined with a high density of individual organisms at a location will indicate a potential tolerance to an environmental stress, but this condition is not observed at locations within the CWC.

Multiple benthic macroinvertebrate metrics were calculated for the data set, including Shannon diversity index, Pielou's evenness, McIntosh's dominance, and Margalef's richness index. Summaries of each biological metric are presented as follows:

- No distinct trends within the CWC or between the CWC and background stations were apparent. A sinusoidal pattern is evident in the metrics (Shannon species diversity index, Pielou's evenness, McIntosh's dominance, and species richness [Margalef's Richness]), indicating that slightly less robust populations occur at certain locations (upstream Transect 6, mid-canal Transect 16, downstream Transects 20, and background location BKG-1). Figures 7 through 10 illustrate the pattern of results for each of these metrics.
- Shannon diversity index is considered moderate for all stations. This indicates that there is not much difference across all stations in the CWC and background station BKG-2, except for Stations T20-3 and BKG-1, for which this metric is lower than it is for the other locations. A moderate to high diversity is an indicator of a well-balanced benthic population. In general, Shannon diversity results for most CWC stations were within or greater than the range of all background values.
- Both Pielou's evenness and McIntosh's dominance appeared to indicate a fairly even distribution among all stations (Figures 7 and 8). Higher indices indicate a relatively even distribution and no apparent effects of environmental stress. Stations T20-3 and BKG-1 had significantly lower evenness and dominance values, and also showed a low Shannon diversity index, but these measurements do not correlate with PAH concentrations.

Table 5 summarizes relative abundance of benthic taxonomic groups at each location. Polychaetes were the most abundant organisms at all stations in the CWC (44 to 99 percent) and background locations (85 to 96 percent). The second most abundant individuals were mollusks, followed by arthropods and organisms in the "other" group. No echinoderms were collected at any of the stations. Of the major taxonomic groups represented here, polychaetes and mollusks are considered more sessile organisms and are subjected to local environmental conditions whereas echinoderms and arthropods are motile and can readily move to more acceptable conditions preferred by these organisms.

The benthic species collected were examined for the presence of pollution-indicator species, as identified in Pearson and Rosenberg (1978). Two pollution-tolerant species (*Capitella capitata* and *Mediomastus californiensis*) were detected at low densities (less than 2 percent) at background stations BKG-1 and BKG-2 and CWC station T18-3. The mere presence of these species at such low numbers does not indicate organic enrichment or environmental stress caused by presence of PAHs in the CWC. Six polychaete genera (*Capitella* sp., *Mediomastus* sp., *Schistomeringos* sp., *Scoloplos* sp., *Prionospio* sp., and *Cirriformia* sp.) and one mollusk genus (*Macoma* sp.) have been identified in the scientific literature as possible indicators of pollution enriched areas. However, most of the individuals collected were not identified to species level or are not known to be pollution-tolerant species and were, therefore, not counted as pollution-tolerant organisms.

2.4.6 Weight of Evidence Evaluations

This section evaluates apparent relationships, or lack thereof, between sediment PAH concentrations, environmental characteristics, and benthic macroinvertebrate communities within the CWC, and in comparison to background.

The BKG 1/2 area is considered an ideal background location for comparison of data from within the CWC. PAHs were detected at very low levels, well below ESVs, and the sediment physical characteristics and water quality are also comparable. The BKG 3/4 area is unique, having a very high TOC (due to an abundance of vegetative debris, typical of a natural mangrove lagoon) and more of a silty/sand sediment type; this area is not a good background candidate for comparison to the CWC biological parameters and is therefore not evaluated further in this section.

Based only on the evaluation of sediment PAH concentrations in comparison to ecologically based sediment screening values, potential adverse effects to benthic organisms are predicted to occur within the CWC between Station -1+00 and Transect 14, although at Transects 12 and 14 only the west side of the CWC indicates a potential for effects. These data are very similar to findings in the RFI, except that the current area of potential risk is less, extending to Transect 14 (compared to Transect 20 in the RFI).

Sediment screening values can be overly conservative in predicting areas of adverse benthic community effects. The quantification of in situ benthic communities collocated with PAH analytical results allows for a determination of measureable effects. Multiple benthic community metrics were evaluated at 15 locations throughout the length of the CWC, and at background locations BKG-1 and BKG-2 at the end of the CWC. As previously described, nearly all metrics demonstrated that CWC benthic communities were comparable to background in terms of number of taxa, organism density, species diversity, evenness, dominance, and richness. Although some individual locations along the CWC had slight decreases in various indices, overall when compared to other indices at the locations there was no strong evidence of general impairment. Similarly, comparison of these benthic community measurements to patterns of potentially toxic sediment PAH concentrations did not demonstrate any relationship. Potential relationships between total PAH concentrations and benthic community metrics (number of taxa and organism density) were evaluated using linear regression. The results indicated no linear relationships.

Evaluation of physical conditions of the sediment and overlying water quality did not identify any important trends or differences along the length of the CWC or in comparison to background. The high percentage of fines (silt and clay) that occurred throughout the CWC naturally limits the diversity of marine benthic organisms. Although the CWC has limited flushing of seawater because it is a long dead-end canal, the water quality profiles conducted at the time of benthic community sampling did not identify any conditions of unusual stress (such as low dissolved oxygen) relative to the background locations at the mouth of the CWC and at the offsite mangrove embayment.

SECTION 3

Conclusions

The evaluation of multiple benthic community characteristics throughout the CWC indicated no adverse effects compared to background or in response to elevated PAH concentrations.

The upper portion of the CWC (Station (-)1+00 south to the vehicle bridge at approximate Station 2+50) is not addressed in this study for the reasons presented in Section 4, Recommendations.

SECTION 4

Recommendations

These findings at SWMU No. 5 indicate that neither sediment removal and disposal nor capping of the sediments is required within the study area (below the vehicle bridge) to be protective of benthic organisms. At this time, long-term monitoring of surface sediment PAHs and benthic macroinvertebrate communities is recommended to confirm that the benthic community health continues.

The upper portion of the CWC (above the vehicle bridge) was not included in this study because it is near the original source of contamination (former Dripolene Pond), the known PAH impacts and shallowness in this portion of the CWC, and the possibility of erosion of the sediments at the northern end of the CWC due to stormwater energy associated with the stormwater outfall from the closed Industrial Landfill. Thus, consideration should be given to containment of the sediments through backfilling this portion of the canal or placement of a subaqueous cap between approximate Stations (-)1+00 and 2+50.

SECTION 5

References

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Tables

TABLE 1

Sediment Chemistry Results and Comparison to Ecological Screening Values

SWMU No. 5, PTPLLC, Peñuelas, Puerto Rico

Station ID	Ecological Marine Sediment Screening		T4-2	T6-2	T8-2	T10-1	T 10-3	T12-1	T12-1	T12-3	T14-1	T14-3	T14-3	T16-1	T16-3	T18-1	T18-3
Sample ID	Values		05-T04-SD2	05-T06-SD2	05-T08-SD2	05-T10-SD1	05-T10-SD3	05-T12-SD1	FD-1_130522	05-T12-SD3	05-T14-SD1	05-T14-SD3	FD-2_130522	05-T16-SD1	05-T16-SD3	05-T18-SD1	05-T18-SD3
Sample Type	ER-L	ER-M	N	N	N	N	N	N	FD	N	N	N	FD	N	N	N	N
Sample Date			5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13
1-Methylnaphthalene	na	na	0.87 =	0.88 =	0.49 J	0.2 J	0.068 J	0.26 J	0.31 J	0.11 J	0.15 J	0.065 J	0.078 J	0.025 J	0.025 J	0.06 =	0.35 =
2-Methylnaphthalene	0.07	0.67	0.66 =	0.54 =	0.28 J	0.19 J	0.052 J	0.2 J	0.25 J	0.11 J	0.11 J	0.071 J	0.09 J	0.027 J	0.029 J	0.057 =	0.23 =
Acenaphthene	0.016	0.5	4.7 =	2.9 =	1.9 J	2.2 J	0.35 J	0.33 J	0.32 J	0.1 J	0.29 J	0.08 J	0.085 J	0.044 J	0.037 J	0.1 =	0.43 =
Acenaphthylene	0.044	0.64	38 =	20 =	17 J	18 J	3.6 J	3 J	3.3 J	0.76 J	3.5 J	0.78 J	0.78 J	0.77 J	0.67 J	1.5 =	2.3 =
Anthracene	0.0853	1.1	12 =	5.1 =	5.3 J	5.6 J	1.1 J	1.7 J	1.7 J	0.34 J	1.3 J	0.32 J	0.37 J	0.27 J	0.23 J	0.78 =	0.94 =
Benzo(a)anthracene	0.261	1.6	15 =	7 =	7.2 J	8.4 J	1.7 J	1.5 J	1.8 J	0.28 J	2.1 J	0.22 J	0.23 J	0.17 J	0.11 J	0.99 =	1.1 =
Benzo(a)pyrene	0.43	1.6	12 =	5.9 =	6.2 J	6.6 J	1.5 J	1 J	1.4 J	0.28 J	1.4 J	0.23 J	0.23 J	0.19 J	0.14 J	0.57 =	0.75 =
Benzo(b)fluoranthene	na	na	11 =	5.6 =	6 J	6.5 J	1.4 J	1.5 J	1.8 J	0.32 J	1.6 J	0.27 J	0.3 J	0.21 J	0.16 J	0.99 =	0.75 =
Benzo(g,h,i)perylene	na	na	1.9 =	1.1 =	1.3 J	1.4 J	0.2 J	0.24 J	0.3 J	0.1 J	0.35 J	0.057 J	0.047 J	0.065 J	0.051 J	0.15 =	0.11 =
Benzo(k)fluoranthene	na	na	2.6 =	1.4 =	1.6 J	2 J	0.4 J	0.33 J	0.42 J	0.091 J	0.43 J	0.08 J	0.08 J	0.06 J	0.047 J	0.24 =	0.19 =
Chrysene	0.384	2.8	14 =	7.3 =	7.3 J	11 J	1.8 J	2.2 J	2.7 J	0.39 J	2.3 J	0.28 J	0.28 J	0.22 J	0.13 J	1.6 =	1.2 =
Dibenz(a,h)anthracene	0.0634	0.26	1 =	0.59 =	0.69 J	0.79 J	0.14 J	0.12 J	0.15 J	0.042 J	0.18 J	0.027 J	0.023 J	0.023 J	0.017 J	0.071 =	0.068 =
Fluoranthene	0.6	5.1	20 =	8.9 =	10 J	14 J	2.2 J	3 J	3.5 J	0.43 J	3.6 J	0.33 J	0.32 J	0.21 J	0.14 J	1.9 =	1.3 =
Fluorene	0.019	0.54	3.9 =	2.9 =	2.1 J	2.5 J	0.58 J	1.1 J	1.2 J	0.16 J	0.78 J	0.14 J	0.16 J	0.1 J	0.085 J	0.41 =	0.61 =
Indeno(1,2,3-c,d)pyrene	na	na	2 =	1.1 =	1.3 J	1.5 J	0.22 J	0.28 J	0.34 J	0.087 J	0.35 J	0.054 J	0.048 J	0.052 J	0.04 J	0.15 =	0.12 =
Naphthalene	0.16	2.1	0.41 =	0.27 =	0.19 J	0.12 J	0.046 J	0.092 J	0.3 J	0.2 J	0.079 J	0.11 J	0.12 J	0.031 J	0.036 J	0.039 =	0.12 =
Phenanthrene	0.24	1.5	6.4 =	4.6 =	4.5 J	4.9 J	0.65 J	4.9 J	5.5 J	0.52 J	3.1 J	0.37 J	0.37 J	0.19 J	0.16 J	2.7 =	2.1 =
Pyrene	0.665	2.6	44 =	22 =	23 J	32 J	4.8 J	4.7 J	5.9 J	0.82 J	6.2 J	0.67 J	0.66 J	0.46 J	0.29 J	3.3 =	2.8 =
Total LMW PAHs	0.552	3.16	66.94	37.19	31.76	33.71	6.446	11.582	12.88	2.3	9.309	1.936	2.053	1.457	1.272	5.646	7.08
Total HMW PAHs	1.7	9.6	123.5	60.89	64.59	84.19	14.36	14.87	18.31	2.84	18.51	2.218	2.218	1.66	1.125	9.961	8.388
Total PAHs	4.022	44.792	190.44	98.08	96.35	117.9	20.806	26.452	31.19	5.14	27.819	4.154	4.271	3.117	2.397	15.607	15.468
ESBTU	--	--	27.3	4.7	6.3	10.5	2.0	4.4	2.4	0.8	4.8	0.5	0.4	0.2	0.2	2.9	1.4
Geochemical Parameters																	
Mean																	
Total Organic Carbon (%)	1.6	4.8	3.7	2.9	2.5	--	2.7	1.7	1.6	--	2.2	3.0	3.1	1.6	2.9		
Gravel (%)	0.0	0.1	0.4	0.9	0.0	--	0.0	0.2	1.7	--	0.1	0.0	0.1	0.0	0.0	0.0	
Sand (%)	13.9	5.4	5.3	26.0	10.2	--	7.9	1.4	49.9	--	1.9	2.4	1.3	31.9	9.2		
Silt (%)	66.1	74.5	71.3	45.1	59.8	--	61.7	63.4	28.9	--	64.5	64.6	62.6	47.1	61.8		
Clay (%)	20.0	20.0	23.0	28.0	30.0	--	30.5	35.0	19.5	--	33.5	33.0	36.0	21.0	29.0		
Fines (silt+clay) (%)	86.1	94.5	94.3	73.1	89.8	--	92.2	98.4	48.4	--	98.0	97.6	98.6	68.1	90.8		

TABLE 1 (Continued)

Sediment Chemistry Results and Comparison to Ecological Screening Values

SWMU No. 5, PTPLLC, Peñuelas, Puerto Rico

Station ID Sample ID Sample Type Sample Date	Ecological Marine Sediment Screening		T20-1 05-T20-SD1	T20-3 05-T20-SD3	BKG-1 BKG-1_130523	BKG-2 BKG-2_130523	BKG-3 BKG-3_130521	BKG-4 BKG-4_130521
	Values		N	N	N	N	N	N
	ER-L	ER-M	5/22/13	5/23/13	5/23/13	5/23/13	5/21/13	5/21/13
1-Methylnaphthalene	na	na	0.029 J	0.03 J	0.0036 J	0.0031 J	0.0029 U	0.0032 J
2-Methylnaphthalene	0.07	0.67	0.033 J	0.032 J	0.0041 J	0.0028 J	0.0029 U	0.0038 J
Acenaphthene	0.016	0.5	0.13 J	0.051 J	0.0057 J	0.0021 UJ	0.0029 U	0.0031 U
Acenaphthylene	0.044	0.64	1.7 J	0.68 J	0.056 J	0.022 J	0.0017 J	0.0085 =
Anthracene	0.0853	1.1	0.58 J	0.21 J	0.017 J	0.0075 J	0.0015 U	0.0042 J
Benzo(a)anthracene	0.261	1.6	0.71 J	0.19 J	0.0097 J	0.0089 J	0.0029 U	0.0045 J
Benzo(a)pyrene	0.43	1.6	0.58 J	0.2 J	0.012 J	0.01 J	0.0029 U	0.0032 J
Benzo(b)fluoranthene	na	na	0.58 J	0.21 J	0.017 J	0.013 J	0.0029 U	0.0055 J
Benzo(g,h,i)perylene	na	na	0.086 J	0.034 J	0.0034 J	0.0054 J	0.0029 U	0.0034 J
Benzo(k)fluoranthene	na	na	0.19 J	0.069 J	0.0045 J	0.0031 J	0.0029 U	0.0031 U
Chrysene	0.384	2.8	0.55 J	0.22 J	0.012 J	0.01 J	0.0015 U	0.0049 J
Dibenz(a,h)anthracene	0.0634	0.26	0.051 J	0.019 J	0.0021 UJ	0.0021 UJ	0.0029 U	0.0031 U
Fluoranthene	0.6	5.1	0.51 J	0.18 J	0.012 J	0.011 J	0.0029 U	0.0062 J
Fluorene	0.019	0.54	0.26 J	0.11 J	0.0097 J	0.0055 J	0.0029 U	0.0031 U
Indeno(1,2,3-c,d)pyrene	na	na	0.091 J	0.035 J	0.0031 J	0.0044 J	0.0029 U	0.0031 U
Naphthalene	0.16	2.1	0.021 J	0.027 J	0.004 J	0.005 J	0.0029 U	0.0056 J
Phenanthrene	0.24	1.5	0.21 J	0.1 J	0.01 J	0.008 J	0.0029 U	0.0096 =
Pyrene	0.665	2.6	2 J	0.42 J	0.034 J	0.03 J	0.004 J	0.011 =
Total LMW PAHs	0.552	3.16	2.963	1.24	0.1101	0.05495	0.01115	0.038
Total HMW PAHs	1.7	9.6	5.348	1.577	0.10875	0.09685	0.01635	0.04335
Total PAHs	4.022	44.792	8.311	2.817	0.21885	0.1518	0.0275	0.08135
ESBTU	--	--	1.1	0.3	0.01	0.01	0.001	0.002
Geochemical Parameters								
Total Organic Carbon (%)	1.6	1.9	3.15	3.69	12.20	13.10		
Gravel (%)	0.2	0.0	0.00	0.00	3.60	0.40		
Sand (%)	22.3	22.7	3.50	3.40	40.30	31.30		
Silt (%)	54.5	55.8	67.00	66.60	41.10	47.30		
Clay (%)	23.0	21.5	29.50	30.00	15.00	21.00		
Fines (silt+clay) (%)	77.5	77.3	96.5	96.6	56.1	68.3		

· all units mg/kg unless otherwise noted

· shaded cell = value greater than effects range-low (ER-L)

· shaded/boxed cell = value greater than ERL and effects range-median (ERM)

· ESBTU = Equilibrium Partitioning Sediment Benchmark Toxic Unit - values above one (**bold**) indicate potential for adverse affects. Supporting

calculations found in Table 4.

TABLE 2

Surface Water Field Parameters

SWMU No. 5, PTPLLC, Peñuelas, Puerto Rico

		Station ID	T4-2	T6-2	T8-2	T10-1	T10-3	T12-1	T12-3	T14-1	T14-3	T16-1	T16-3	T18-1	T18-3	T20-1	T20-3	BKG-1	BKG-2	BKG-3	BKG-4
		Sample Date	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/22/13	5/23/13	5/23/13	5/21/13	5/21/13	
Total Depth	ft		4	7	7.5	9.0	10	9.0	9.5	9.0	10.0	10		12	10	12	10	18	12	6.33	4.42
Temperature	°C	Surface	28.5		28.2		28.3				28.4			28.2		28.3		28.6		28.9	29.7
		Mid (depth)	28.7		28.6		28.6 4 (ft)				28.6 (3 ft)			28.4 6 (ft)		28.4 6 (ft)		28.4 9 (ft)		28.9	29.6
		Mid (depth)			28.4		28.4 7 (ft)				28.5 (6 ft)			28.4 9 (ft)		28.4 9 (ft)		28.4 5 (ft)		28.4	29.4
		Bottom	28.7		28.5		28.4				28.4			28.4		28.4		28.4		28.9	29.4
Salinity	‰	Surface	36.6		36.5		36.5				36.6			36.4		36.5		36.8		36.6	36.7
		Mid (depth)	36.8		37.0		37.0 4 (ft)				36.9 (3 ft)			37.2 6 (ft)		37.2 6 (ft)		37.2 9 (ft)		36.7	36.8
		Mid (depth)			37.2		37.2 7 (ft)				37.1 (6 ft)			37.3 9 (ft)		37.3 9 (ft)		37.3 5 (ft)		36.8	36.7
		Bottom	37.1				37.2				36.2			37.2		37.3		37.3		36.8	36.7
Conductivity	mS/cm	Surface	55.3		55.2		55.2				55.3			55.0		55.0		55.7		55.3	55.6
		Mid (depth)	55.7		55.9		55.9 4 (ft)				55.7 (3 ft)			56.1 6 (ft)		56.1 6 (ft)		56.1 9 (ft)		55.5	55.6
		Mid (depth)			56.1		56.1 7 (ft)				56.0 (6 ft)			56.2 9 (ft)		56.2 9 (ft)		56.3 5 (ft)		55.6	55.4
		Bottom	56.0				56.2				56.1			56.1		56.2		56.3		55.6	55.4
DO	mg/L	Surface	3.0		3.6		3.4				3.6			3.6		3.7		3.8		4.4	4.7
		Mid (depth)	3.1		3.8		4.5 4 (ft)				4.2 (3 ft)			4.5 6 (ft)		4.3 6 (ft)		4.2 9 (ft)		4.2	4.5
		Mid (depth)			4.7		4.7 7 (ft)				4.5 (6 ft)			4.5 9 (ft)		4.4 9 (ft)		4.2 5 (ft)		4.3	4.4
		Bottom	3.8				4.7				4.3			4.4		4.2		4.3		3.9	4.4
Oxy Sat	%	Surface	48.5		57.1		54.3				56.6			57.7		58.2		62.5		70.0	74.1
		Mid (depth)	48.2		60.2		71.2 4 (ft)				66.4 (3 ft)			71.5 6 (ft)		67.5 6 (ft)		66.8 9 (ft)		67.0	72.0
		Mid (depth)			68.7		74.3 7 (ft)				70.9 (6 ft)			71.2 9 (ft)		68.7 9 (ft)		66.4.5 (ft)		67.2	69.8
		Bottom	59.5				74.4				67.0			69.6		66.6		67.2		62.7	69.8
pH	su	Surface	7.9		7.8		7.8				7.8			7.8		7.8		7.9		8.0	8.1
		Mid (depth)	7.7		7.8		7.9 4 (ft)				7.9 (3 ft)			7.9 6 (ft)		7.9 6 (ft)		7.9 9 (ft)		8.0	8.1
		Mid (depth)			7.9		7.9 7 (ft)				7.9 (6 ft)			7.9 9 (ft)		7.9 9 (ft)		7.9 5 (ft)		8.0	8.0
		Bottom	7.8				7.9				7.9			7.9		7.9		7.9		8.0	8.0
Turbidity	NTU	Surface	5.8		5.1		3.9				2.9			3.0		3.6		3.7		2.3	3.3

TABLE 3

Benthic Macroinvertebrate Results

SWMU No. 5, PTPLLC, Peñuelas, Puerto Rico

Station ID		T4-2 05-T04-BN2 5/22/13	T6-2 05-T06-BN2 5/22/13	T8-2 05-T08-BN2 5/22/13	T10-1 05-T10-BN1 5/22/13	T10-3 05-T10-BN3 5/22/13	T12-1 05-T12-BN1 5/22/13	T12-3 05-T12-BN3 5/22/13	T14-1 05-T14-BN1 5/22/13	T14-3 05-T14-BN3 5/22/13	T16-1 05-T16-BN1 5/22/13	T16-3 05-T16-BN3 5/22/13	T18-1 05-T18-BN1 5/22/13	T18-3 05-T18-BN3 5/22/13	T20-1 05-T20-BN1 5/22/13	T20-3 05-T20-BN3 5/23/13	BKG-1 BKG-BN1 5/23/13	BKG-2 BKG-BN2 5/23/13	BKG-3 BKG-BN3 5/21/13	BKG-4 BKG-BN4 5/21/13
Sample ID																				
Sample Date		05/22/13	05/22/13	05/22/13	05/22/13	05/22/13	05/22/13	05/22/13	05/22/13	05/22/13	05/22/13	05/22/13	05/22/13	05/22/13	05/23/13	05/23/13	05/21/13	05/21/13		
Benthic Indices																				
Total Individuals		81	52	103	65	28	94	48	86	18	75	16	119	121	165	243	49	216	130	115
Total Individuals / m ²		1164	747	1480	934	402	1351	690	1236	259	1078	230	1710	1739	2371	3491	704	3103	1868	1379
Number of Taxa		18	9	15	13	14	17	12	24	7	11	5	15	18	21	12	8	21	5	8
Shannon Diversity Index		2.00	1.49	2.16	2.22	2.46	2.05	1.99	2.62	1.83	1.43	1.42	1.80	1.89	2.00	0.87	0.76	1.98	1.26	1.43
Pielou's Evenness		0.69	0.68	0.80	0.87	0.93	0.72	0.80	0.82	0.94	0.60	0.88	0.67	0.65	0.66	0.35	0.36	0.65	0.78	0.69
McIntosh's Dominance		0.57	0.52	0.63	0.73	0.84	0.60	0.68	0.76	0.43	0.65	0.56	0.57	0.59	0.24	0.19	0.58	0.45	0.48	
Margalef's Richness Index		3.87	2.03	3.02	2.88	3.90	3.52	2.84	5.16	2.08	2.32	1.44	2.93	3.55	3.92	2.00	1.80	3.72	0.82	1.48
Feeding Guilds																				
Collector-Filterer/Suspension Feeder	# Indiv/m ²	122	72	402	223	137	208	72	101	0	43	0	50	58	79	36	0	194	287	230
	# Taxa	5	3	5	4	6	7	5	7	0	3	0	4	3	5	3	0	5	2	3
Subsurface Collector-Gatherer/Deposit Feeder	# Indiv/m ²	647	316	819	417	115	431	129	517	129	244	72	316	374	560	86	618	1236	517	532
	# Taxa	3	2	5	3	4	4	2	5	3	1	3	5	6	4	3	3	1	2	
Epibenthic Collector-Gatherer Deposit Feeder	# Indiv/m ²	22	0	201	79	79	668	259	374	101	661	72	1286	1164	1602	3341	43	1236	467	374
	# Taxa	2	0	2	4	3	7	2	6	2	3	1	5	4	6	4	3	7	1	1
Predator/Carnivore	# Indiv/m ²	14	72	43	216	72	43	230	187	29	129	72	43	72	58	29	29	50	596	517
	# Taxa	1	3	2	3	2	2	3	5	2	3	2	3	2	4	2	2	2	3	
Scraper	# Indiv/m ²	115	0	14	0	0	0	0	43	0	0	0	0	29	72	0	0	29	0	0
	# Taxa	4	0	1	0	0	0	0	0	2	0	0	0	1	1	0	0	2	0	0
Browser-Grazer	# Indiv/m ²	115	144	0	0	0	0	0	7	0	0	7	7	22	0	0	0	7	172	0
	# Taxa	3	1	0	0	0	0	0	0	1	0	0	1	3	0	0	0	1	4	0
Scavenger (animals)	# Indiv/m ²	115	144	0	0	0	0	0	0	7	0	0	7	7	22	0	0	7	172	0
	# Taxa	3	1	0	0	0	0	0	0	1	0	0	1	3	0	0	0	1	4	0
Unspecified	# Indiv/m ²	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0
	# Taxa	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Species Raw Data																				
Actiniaria (LPIL)	#/m ²	0	43	0	72	57	14	0	0	14	14	14	0	0	0	0	0	0	0	0
Cnidaria (LPIL)	#/m ²	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0
Capitella capitata complex Blake	#/m ²	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	14	0	0
Capitella sp.	#/m ²	517	287	560	43	0	0	0	72	29	0	0	0	0	43	0	0	57	0	0
Capitellidae (LPIL)	#/m ²	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0
Mediomastus californiensis	#/m ²	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0
Mediomastus sp.	#/m ²	0	0	0	0	0	0	86	0	29	0	0	0	0	0	29	0	0	0	0
Cossura delta	#/m ²	0	0	0	0	0	0	0	0	0	0	0	0	0	72	0	0	0	0	0
Dorvilleidae (LPIL)	#/m ²	0	0	0	0	0	0	14	0	0	0	0	0	0	0	14	0	0	129	72
Ophryotrocha sp.	#/m ²	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
Schistomeringos rudolphii	#/m ²	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schistomeringos sp.	#/m ²	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0
Scoletoma sp.	#/m ²	0	0	0	0	0	0	0	14	0	0	0	0	0	14	0	0	14	0	0
Scoloplos sp.	#/m ²	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	14	0	0	0
Scoloplos texana	#/m ²	0	0	43	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0</td

TABLE 3
Benthic Macroinvertebrate Results
SWMU No. 5, PTPLLC, Peñuelas, Puerto Rico

TABLE 4

Sediment Toxicity Screening Using Equilibrium Partitioning Sediment Benchmarks

SWMU No. 5, PTPLLC, Peñuelas, Puerto Rico

PAH	05-T04-2			05-T06-2			05-T08-2			05-T10-1			05-T10-3			05-T12-1			05-T12-1 (FD)			
	PAH Effect Concentration (mg/kg _{oc})	Measured OC		ESBTU (individual) ²																		
		Conc. (mg/kg dry wt.)	Normalized Conc. (mg/kg _{oc}) ¹		Conc. (mg/kg dry wt.)	Normalized Conc. (mg/kg _{oc}) ¹		Conc. (mg/kg dry wt.)	Normalized Conc. (mg/kg _{oc}) ¹		Conc. (mg/kg dry wt.)	Normalized Conc. (mg/kg _{oc}) ¹		Conc. (mg/kg dry wt.)	Normalized Conc. (mg/kg _{oc}) ¹		Conc. (mg/kg dry wt.)	Normalized Conc. (mg/kg _{oc}) ¹				
1-Methylnaphthalene	446	0.87 =	54.72	0.1227	0.88 =	18.45	0.0414	0.49 J	13.14	0.0295	0.2 J	6.87	0.0154	0.068 J	2.69	0.0060	0.26 J	15.03	0.0337	0.31 J	8.27	0.0185
2-Methylnaphthalene	447	0.66 =	41.51	0.0929	0.54 =	11.32	0.0253	0.28 J	7.51	0.0168	0.19 J	6.53	0.0146	0.052 J	2.06	0.0046	0.2 J	11.56	0.0259	0.25 J	6.67	0.0149
Acenaphthene	491	4.7 =	295.60	0.6020	2.9 =	60.80	0.1238	1.9 J	50.94	0.1037	2.2 J	75.60	0.1540	0.35 J	13.83	0.0282	0.33 J	19.08	0.0388	0.32 J	8.53	0.0174
Acenaphthylene	452	38 =	2389.94	5.2875	20 =	419.29	0.9276	17 J	455.76	1.0083	18 J	618.56	1.3685	3.6 J	142.29	0.3148	3 J	173.41	0.3837	3.3 J	88.00	0.1947
Anthracene	594	12 =	754.72	1.2706	5.1 =	106.92	0.1800	5.3 J	142.09	0.2392	5.6 J	192.44	0.3240	1.1 J	43.48	0.0732	1.7 J	98.27	0.1654	1.7 J	45.33	0.0763
Benzo(a)anthracene	841	15 =	943.40	1.1218	7 =	146.75	0.1745	7.2 J	193.03	0.2295	8.4 J	288.66	0.3432	1.7 J	67.19	0.0799	1.5 J	86.71	0.1031	1.8 J	48.00	0.0571
Benzo(a)pyrene	965	12 =	754.72	0.7821	5.9 =	123.69	0.1282	6.2 J	166.22	0.1722	6.6 J	226.80	0.2350	1.5 J	59.29	0.0614	1 J	57.80	0.0599	1.4 J	37.33	0.0387
Benzo(b)fluoranthene	979	11 =	691.82	0.7067	5.6 =	117.40	0.1199	6 J	160.86	0.1643	6.5 J	223.37	0.2282	1.4 J	55.34	0.0565	1.5 J	86.71	0.0886	1.8 J	48.00	0.0490
Benzo(g,h,i)perylene	1095	1.9 =	119.50	0.1091	1.1 =	23.06	0.0211	1.3 J	34.85	0.0318	1.4 J	48.11	0.0439	0.2 J	7.91	0.0072	0.24 J	13.87	0.0127	0.3 J	8.00	0.0073
Benzo(k)fluoranthene	981	2.6 =	163.52	0.1667	1.4 =	29.35	0.0299	1.6 J	42.90	0.0437	2 J	68.73	0.0701	0.4 J	15.81	0.0161	0.33 J	19.08	0.0194	0.42 J	11.20	0.0114
Chrysene	844	14 =	880.50	1.0433	7.3 =	153.04	0.1813	7.3 J	195.71	0.2319	11 J	378.01	0.4479	1.8 J	71.15	0.0843	2.2 J	127.17	0.1507	2.7 J	72.00	0.0853
Dibenz(a,h)anthracene	1123	1 =	62.89	0.0560	0.59 =	12.37	0.0110	0.69 J	18.50	0.0165	0.79 J	27.15	0.0242	0.14 J	5.53	0.0049	0.12 J	6.94	0.0062	0.15 J	4.00	0.0036
Fluoranthene	707	20 =	1257.86	1.7792	8.9 =	186.58	0.2639	10 J	268.10	0.3792	14 J	481.10	0.6805	2.2 J	86.96	0.1230	3 J	173.41	0.2453	3.5 J	93.33	0.1320
Fluorene	538	3.9 =	245.28	0.4559	2.9 =	60.80	0.1130	2.1 J	56.30	0.1046	2.5 J	85.91	0.1597	0.58 J	22.92	0.0426	1.1 J	63.58	0.1182	1.2 J	32.00	0.0595
Indeno(1,2,3-c,d)pyrene	1115	2 =	125.79	0.1128	1.1 =	23.06	0.0207	1.3 J	34.85	0.0313	1.5 J	51.55	0.0462	0.22 J	8.70	0.0078	0.28 J	16.18	0.0145	0.34 J	9.07	0.0081
Naphthalene	385	0.41 =	25.79	0.0670	0.27 =	5.66	0.0147	0.19 J	5.09	0.0132	0.12 J	4.12	0.0107	0.046 J	1.82	0.0047	0.092 J	5.32	0.0138	0.3 J	8.00	0.0208
Phenanthrene	596	6.4 =	402.52	0.6754	4.6 =	96.44	0.1618	4.5 J	120.64	0.2024	4.9 J	168.38	0.2825	0.65 J	25.69	0.0431	4.9 J	283.24	0.4752	5.5 J	146.67	0.2461
Pyrene	697	44 =	2767.30	3.9703	22 =	461.22	0.6617	23 J	616.62	0.8847	32 J	1099.66	1.5777	4.8 J	189.72	0.2722	4.7 J	271.68	0.3898	5.9 J	157.33	0.2257
Summed ESBTU			9.9			1.7			2.3			3.8			0.7			1.6			0.9	
Applied Uncertainty Factor of 2.75			27.3			4.7			6.3			10.5			2.0			4.4			2.4	
Sample Specific f _{oc}			0.0159			0.0477			0.0373			0.0291			0.0253			0.0173			0.0375	

Notes:

OC = organic carbon

ESBTU = Equilibrium Partitioning Sediment Benchmark Toxic Unit

PAH = polycyclic aromatic hydrocarbon

1 = Calculated by dividing the measured PAH concentration by the sample specific fraction of organic carbon (f_{oc})

2 = Calculated by dividing the organic carbon-normalized PAH values by the PAH-specific effect concentrations

TABLE 4

Sediment Toxicity Screening Using Equilibrium Partitioning Sediment Benchmarks

SWMU No. 5, PTPLLC, Peñuelas, Puerto Rico

PAH	05-T12-3			05-T14-1			05-T14-3			05-T14-3 (FD)			05-T16-1			05-T16-3			05-T18-1			
	PAH Effect Concentration (mg/kg _{oc})	Measured OC		ESBTU (individual) ²	Measured OC Conc. (mg/kg dry wt.)	Measured OC		ESBTU (individual) ²	Measured OC Conc. (mg/kg dry wt.)	Measured OC		ESBTU (individual) ²	Measured OC Conc. (mg/kg dry wt.)	Measured OC		ESBTU (individual) ²	Measured OC Conc. (mg/kg dry wt.)	Measured OC		ESBTU (individual) ²		
		Conc. (mg/kg _{oc}) ¹	Normalized Conc. (mg/kg _{oc}) ¹			Conc. (mg/kg dry wt.)	Normalized Conc. (mg/kg _{oc}) ¹			Conc. (mg/kg dry wt.)	Normalized Conc. (mg/kg _{oc}) ¹			Conc. (mg/kg dry wt.)	Normalized Conc. (mg/kg _{oc}) ¹			Conc. (mg/kg dry wt.)	Normalized Conc. (mg/kg _{oc}) ¹			
1-Methylnaphthalene	446	0.11 J	6.36	0.0143	0.15 J	9.43	0.0212	0.065 J	3.02	0.0068	0.078 J	3.42	0.0077	0.025 J	0.85	0.0019	0.025 J	0.81	0.0018	0.06 =	3.70	0.0083
2-Methylnaphthalene	447	0.11 J	6.36	0.0142	0.11 J	6.92	0.0155	0.071 J	3.30	0.0074	0.09 J	3.95	0.0088	0.027 J	0.92	0.0020	0.029 J	0.94	0.0021	0.057 =	3.52	0.0079
Acenaphthene	491	0.1 J	5.78	0.0118	0.29 J	18.24	0.0371	0.08 J	3.72	0.0076	0.085 J	3.73	0.0076	0.044 J	1.49	0.0030	0.037 J	1.20	0.0024	0.1 =	6.17	0.0126
Acenaphthylene	452	0.76 J	43.93	0.0972	3.5 J	220.13	0.4870	0.78 J	36.28	0.0803	0.78 J	34.21	0.0757	0.77 J	26.10	0.0577	0.67 J	21.68	0.0480	1.5 =	92.59	0.2049
Anthracene	594	0.34 J	19.65	0.0331	1.3 J	81.76	0.1376	0.32 J	14.88	0.0251	0.37 J	16.23	0.0273	0.27 J	9.15	0.0154	0.23 J	7.44	0.0125	0.78 =	48.15	0.0811
Benzo(a)anthracene	841	0.28 J	16.18	0.0192	2.1 J	132.08	0.1570	0.22 J	10.23	0.0122	0.23 J	10.09	0.0105	0.17 J	5.76	0.0069	0.11 J	3.56	0.0042	0.99 =	61.11	0.0727
Benzo(a)pyrene	965	0.28 J	16.18	0.0168	1.4 J	88.05	0.0912	0.23 J	10.70	0.0111	0.23 J	10.09	0.0105	0.19 J	6.44	0.0067	0.14 J	4.53	0.0047	0.57 =	35.19	0.0365
Benzo(b)fluoranthene	979	0.32 J	18.50	0.0189	1.6 J	100.63	0.1028	0.27 J	12.56	0.0128	0.3 J	13.16	0.0134	0.21 J	7.12	0.0073	0.16 J	5.18	0.0053	0.99 =	61.11	0.0624
Benzo(g,h,i)perylene	1095	0.1 J	5.78	0.0053	0.35 J	22.01	0.0201	0.057 J	2.65	0.0024	0.047 J	2.06	0.0019	0.065 J	2.20	0.0020	0.051 J	1.65	0.0015	0.15 =	9.26	0.0085
Benzo(k)fluoranthene	981	0.091 J	5.26	0.0054	0.43 J	27.04	0.0276	0.08 J	3.72	0.0038	0.08 J	3.51	0.0036	0.06 J	2.03	0.0021	0.047 J	1.52	0.0016	0.24 =	14.81	0.0151
Chrysene	844	0.39 J	22.54	0.0267	2.3 J	144.65	0.1714	0.28 J	13.02	0.0154	0.28 J	12.28	0.0146	0.22 J	7.46	0.0088	0.13 J	4.21	0.0050	1.6 =	98.77	0.1170
Dibenz(a,h)anthracene	1123	0.042 J	2.43	0.0022	0.18 J	11.32	0.0101	0.027 J	1.26	0.0011	0.023 J	1.01	0.0009	0.023 J	0.78	0.0007	0.017 J	0.55	0.0005	0.071 =	4.38	0.0039
Fluoranthene	707	0.43 J	24.86	0.0352	3.6 J	226.42	0.3202	0.33 J	15.35	0.0217	0.32 J	14.04	0.0199	0.21 J	7.12	0.0101	0.14 J	4.53	0.0064	1.9 =	117.28	0.1659
Fluorene	538	0.16 J	9.25	0.0172	0.78 J	49.06	0.0912	0.14 J	6.51	0.0121	0.16 J	7.02	0.0130	0.1 J	3.39	0.0063	0.085 J	2.75	0.0051	0.41 =	25.31	0.0470
Indeno(1,2,3-c,d)pyrene	1115	0.087 J	5.03	0.0045	0.35 J	22.01	0.0197	0.054 J	2.51	0.0023	0.048 J	2.11	0.0019	0.052 J	1.76	0.0016	0.04 J	1.29	0.0012	0.15 =	9.26	0.0083
Naphthalene	385	0.2 J	11.56	0.0300	0.079 J	4.97	0.0129	0.11 J	5.12	0.0133	0.12 J	5.26	0.0137	0.031 J	1.05	0.0027	0.036 J	1.17	0.0030	0.039 =	2.41	0.0063
Phenanthrene	596	0.52 J	30.06	0.0504	3.1 J	194.97	0.3271	0.37 J	17.21	0.0289	0.37 J	16.23	0.0272	0.19 J	6.44	0.0108	0.16 J	5.18	0.0087	2.7 =	166.67	0.2796
Pyrene	697	0.82 J	47.40	0.0680	6.2 J	389.94	0.5595	0.67 J	31.16	0.0447	0.66 J	28.95	0.0415	0.46 J	15.59	0.0224	0.29 J	9.39	0.0135	3.3 =	203.70	0.2923
Summed ESBTU		0.3			1.8			0.2			0.2			0.1			0.1			1.0		
Applied Uncertainty Factor of 2.75		0.8			4.8			0.5			0.4			0.2			0.2			2.9		
Sample Specific f _{oc}		0.0173			0.0159			0.0215			0.0228			0.0295			0.0309			0.0162		

Notes:

OC = organic carbon

ESBTU = Equilibrium Partitioning Sediment Benchmark Toxic Unit

PAH = polycyclic aromatic hydrocarbon

1 = Calculated by dividing the measured PAH concentration by the sample specific fraction of organic carbon (f_{oc})

2 = Calculated by dividing the organic carbon-normalized PAH values by the PAH-specific effect concentrations

TABLE 4

Sediment Toxicity Screening Using Equilibrium Partitioning Sediment Benchmarks

SWMU No. 5, PTPLLC, Peñuelas, Puerto Rico

PAH	05-T18-3			05-T20-1			05-T20-3			05-BKG-1			05-BKG-2			05-BKG-3			05-BKG-4			
	PAH Effect Concentration (mg/kg _{oc})	Measured OC		ESBTU (individual) ²	Measured Conc. (mg/kg dry wt.)	Measured OC		ESBTU (individual) ²	Measured Conc. (mg/kg dry wt.)	Measured OC		ESBTU (individual) ²	Measured Conc. (mg/kg dry wt.)	Measured OC		ESBTU (individual) ²	Measured Conc. (mg/kg dry wt.)	Measured OC		ESBTU (individual) ²		
		Conc. (mg/kg _{oc}) ¹	Normalized Conc. (mg/kg _{oc}) ¹			Conc. (mg/kg _{oc}) ¹	Normalized Conc. (mg/kg _{oc}) ¹			Conc. (mg/kg _{oc}) ¹	Normalized Conc. (mg/kg _{oc}) ¹			Conc. (mg/kg _{oc}) ¹	Normalized Conc. (mg/kg _{oc}) ¹			Conc. (mg/kg _{oc}) ¹	Normalized Conc. (mg/kg _{oc}) ¹			
1-Methylnaphthalene	446	0.35 =	12.15	0.0272	0.029 J	1.80	0.0040	0.03 J	1.56	0.0035	0.0036 J	0.11	0.0003	0.0031 J	0.08	0.0002	0.0029 U	0.02	0.0001	0.0032 J	0.02	0.0001
2-Methylnaphthalene	447	0.23 =	7.99	0.0179	0.033 J	2.05	0.0046	0.032 J	1.67	0.0037	0.0041 J	0.13	0.0003	0.0028 J	0.08	0.0002	0.0029 U	0.02	0.0001	0.0038 J	0.03	0.0001
Acenaphthene	491	0.43 =	14.93	0.0304	0.13 J	8.07	0.0164	0.051 J	2.66	0.0054	0.0057 J	0.18	0.0004	0.0021 UJ	0.06	0.0001	0.0029 U	0.02	0.0000	0.0031 U	0.02	0.0000
Acenaphthylene	452	2.3 =	79.86	0.1767	1.7 J	105.59	0.2336	0.68 J	35.42	0.0784	0.056 J	1.78	0.0039	0.022 J	0.60	0.0013	0.0017 J	0.01	0.0000	0.0085 =	0.06	0.0001
Anthracene	594	0.94 =	32.64	0.0549	0.58 J	36.02	0.0606	0.21 J	10.94	0.0184	0.017 J	0.54	0.0009	0.0075 J	0.20	0.0003	0.0015 U	0.01	0.0000	0.0042 J	0.03	0.0001
Benzo(a)anthracene	841	1.1 =	38.19	0.0454	0.71 J	44.10	0.0524	0.19 J	9.90	0.0118	0.0097 J	0.31	0.0004	0.0089 J	0.24	0.0003	0.0029 U	0.02	0.0000	0.0045 J	0.03	0.0000
Benzo(a)pyrene	965	0.75 =	26.04	0.0270	0.58 J	36.02	0.0373	0.2 J	10.42	0.0108	0.012 J	0.38	0.0004	0.01 J	0.27	0.0003	0.0029 U	0.02	0.0000	0.0032 J	0.02	0.0000
Benzo(b)fluoranthene	979	0.75 =	26.04	0.0266	0.58 J	36.02	0.0368	0.21 J	10.94	0.0112	0.017 J	0.54	0.0006	0.013 J	0.35	0.0004	0.0029 U	0.02	0.0000	0.0055 J	0.04	0.0000
Benzo(g,h,i)perylene	1095	0.11 =	3.82	0.0035	0.086 J	5.34	0.0049	0.034 J	1.77	0.0016	0.0034 J	0.11	0.0001	0.0054 J	0.15	0.0001	0.0029 U	0.02	0.0000	0.0034 J	0.03	0.0000
Benzo(k)fluoranthene	981	0.19 =	6.60	0.0067	0.19 J	11.80	0.0120	0.069 J	3.59	0.0037	0.0045 J	0.14	0.0001	0.0031 J	0.08	0.0001	0.0029 U	0.02	0.0000	0.0031 U	0.02	0.0000
Chrysene	844	1.2 =	41.67	0.0494	0.55 J	34.16	0.0405	0.22 J	11.46	0.0136	0.012 J	0.38	0.0005	0.01 J	0.27	0.0003	0.0015 U	0.01	0.0000	0.0049 J	0.04	0.0000
Dibenz(a,h)anthracene	1123	0.068 =	2.36	0.0021	0.051 J	3.17	0.0028	0.019 J	0.99	0.0009	0.0021 UJ	0.07	0.0001	0.0021 UJ	0.06	0.0001	0.0029 U	0.02	0.0000	0.0031 U	0.02	0.0000
Fluoranthene	707	1.3 =	45.14	0.0638	0.51 J	31.68	0.0448	0.18 J	9.38	0.0133	0.012 J	0.38	0.0005	0.011 J	0.30	0.0004	0.0029 U	0.02	0.0000	0.0062 J	0.05	0.0001
Fluorene	538	0.61 =	21.18	0.0394	0.26 J	16.15	0.0300	0.11 J	5.73	0.0106	0.0097 J	0.31	0.0006	0.0055 J	0.15	0.0003	0.0029 U	0.02	0.0000	0.0031 U	0.02	0.0000
Indeno(1,2,3-c,d)pyrene	1115	0.12 =	4.17	0.0037	0.091 J	5.65	0.0051	0.035 J	1.82	0.0016	0.0031 J	0.10	0.0001	0.0044 J	0.12	0.0001	0.0029 U	0.02	0.0000	0.0031 U	0.02	0.0000
Naphthalene	385	0.12 =	4.17	0.0108	0.021 J	1.30	0.0034	0.027 J	1.41	0.0037	0.004 J	0.13	0.0003	0.005 J	0.14	0.0004	0.0029 U	0.02	0.0001	0.0056 J	0.04	0.0001
Phenanthrene	596	2.1 =	72.92	0.1223	0.21 J	13.04	0.0219	0.1 J	5.21	0.0087	0.01 J	0.32	0.0005	0.008 J	0.22	0.0004	0.0029 U	0.02	0.0000	0.0096 =	0.07	0.0001
Pyrene	697	2.8 =	97.22	0.1395	2 J	124.22	0.1782	0.42 J	21.88	0.0314	0.034 J	1.08	0.0015	0.03 J	0.81	0.0012	0.004 J	0.03	0.0000	0.011 =	0.08	0.0001
Summed ESBTU		0.5		0.4		0.1		0.005		0.004		0.0004		0.0001		0.001		0.002				
Applied Uncertainty Factor of 2.75		1.4		1.1		0.3		0.01		0.01		0.001		0.001		0.002		0.001				
Sample Specific f _{oc}		0.0288		0.0161		0.0192		0.0315		0.0369		0.122		0.131								

Notes:

OC = organic carbon

ESBTU = Equilibrium Partitioning Sediment Benchmark Toxic Unit

PAH = polycyclic aromatic hydrocarbon

1 = Calculated by dividing the measured PAH concentration by the sample specific fraction of organic carbon (f_{oc})

2 = Calculated by dividing the organic carbon

TABLE 5

Relative Abundance of the Benthic Invertebrate Phyla (Percent of Total Individuals)

SWMU No. 5, PTPLLC, Peñuelas, Puerto Rico

Station	Taxonomic Group				
	Polychaete	Mollusk	Arthropod	Echinoderm	Other
T4-2	58.2	22.1	19.8	0	0
T6-2	44.3	9.5	40.4	0	5.8
T8-2	69.9	30.1	0	0	0
T10-1	69.2	23	0	0	7.7
T10-3	50	35.8	0	0	14.3
T12-1	83	14.9	1	0	1
T12-3	89.8	8.2	0	0	2
T14-1	88.6	9.2	2.3	0	0
T14-3	89.1	5.4	0	0	5.4
T16-1	96.1	1.3	1.3	0	1.3
T16-3	87.8	0	6.1	0	6.1
T18-1	95.9	1.6	1.6	0	0.8
T18-3	91.8	2.5	4.9	0	0
T20-1	95.2	4.2	0.6	0	0
T20-3	98.8	1.2	0	0	0
BKG-1	96	0	2	0	0
BKG-2	85.3	3.2	11.1	0	0
BKG-3	84.6	15.4	0	0	0
BKG-4	86.1	13.9	0	0	0

Figures

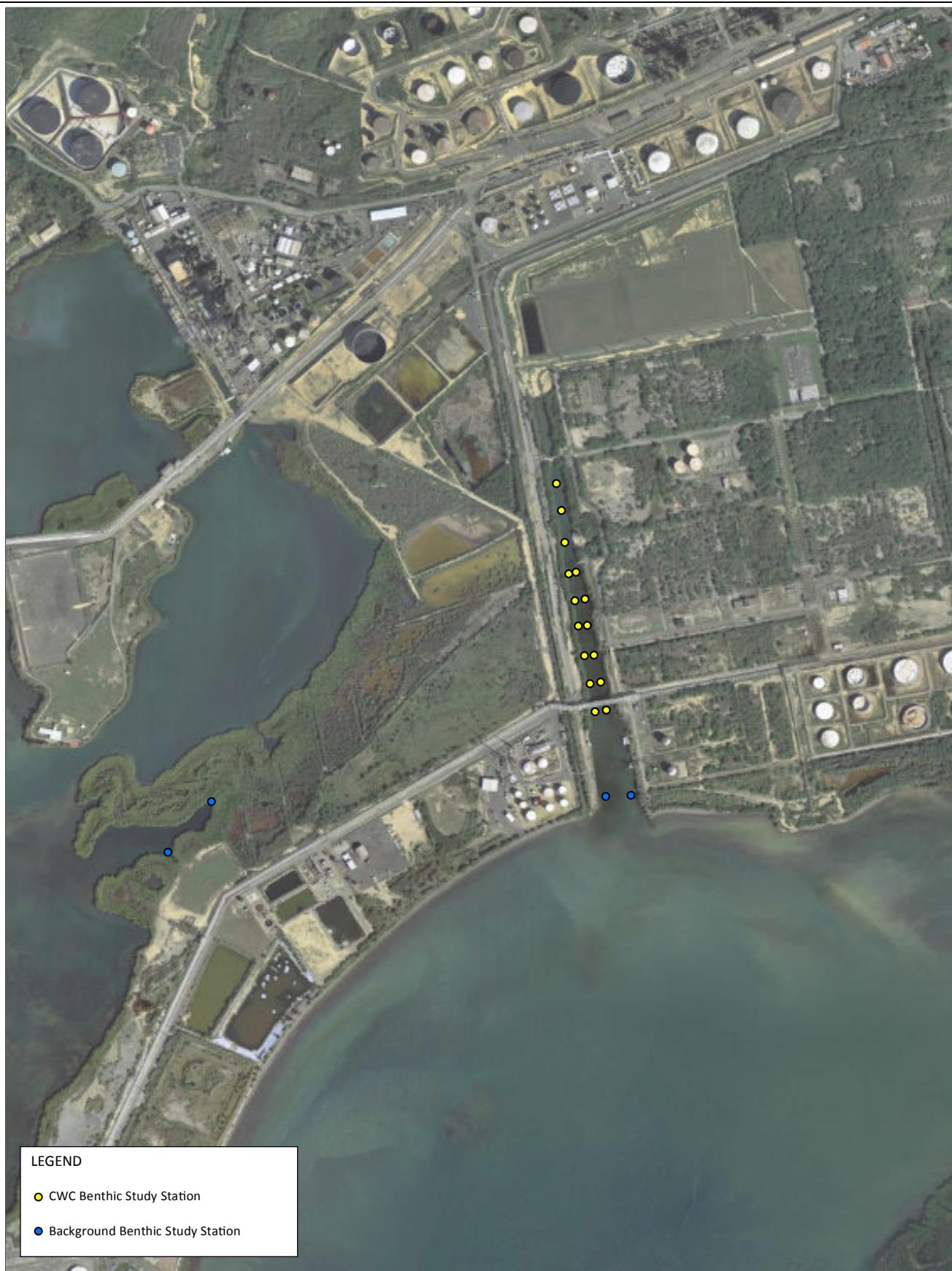
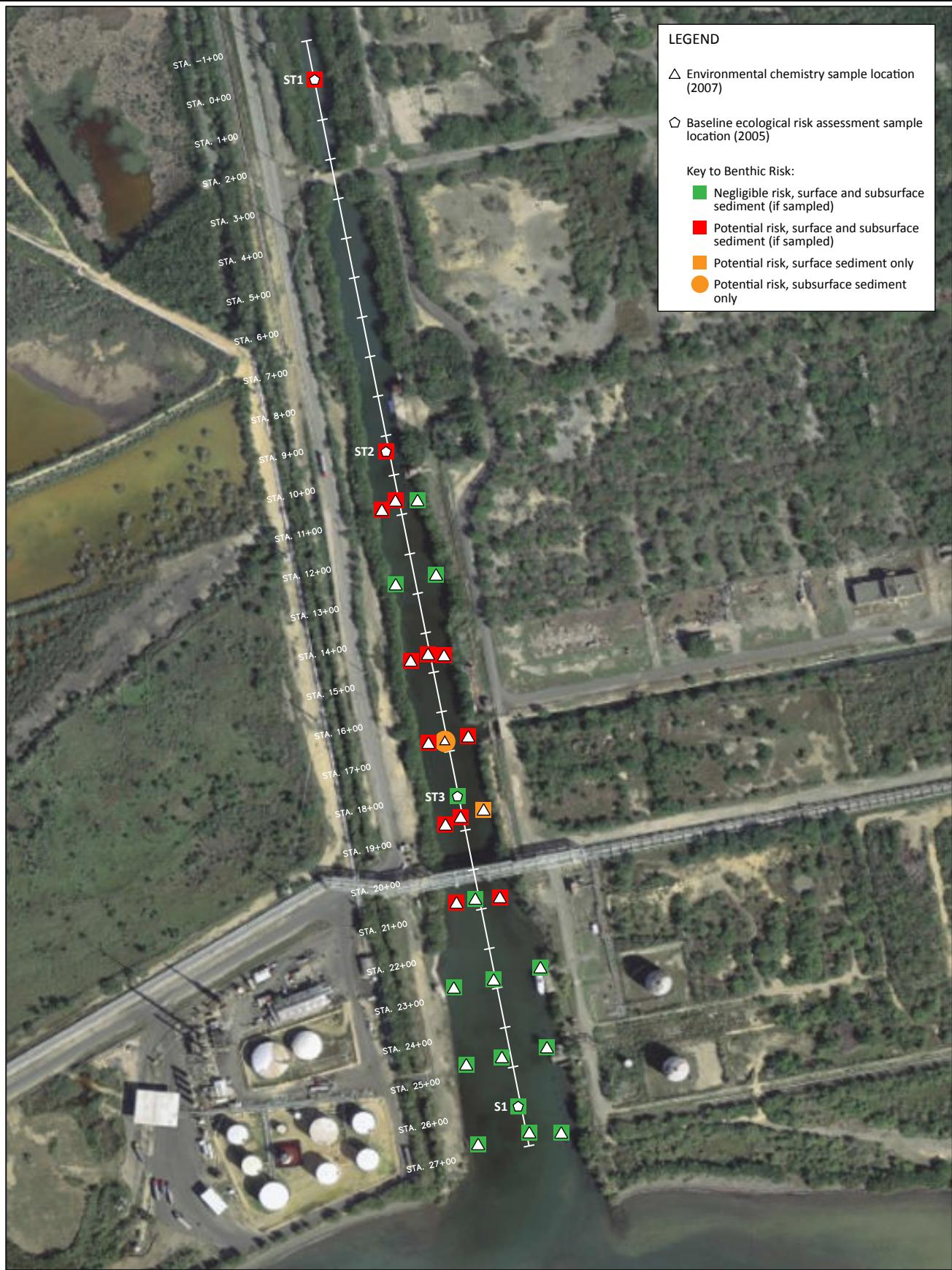
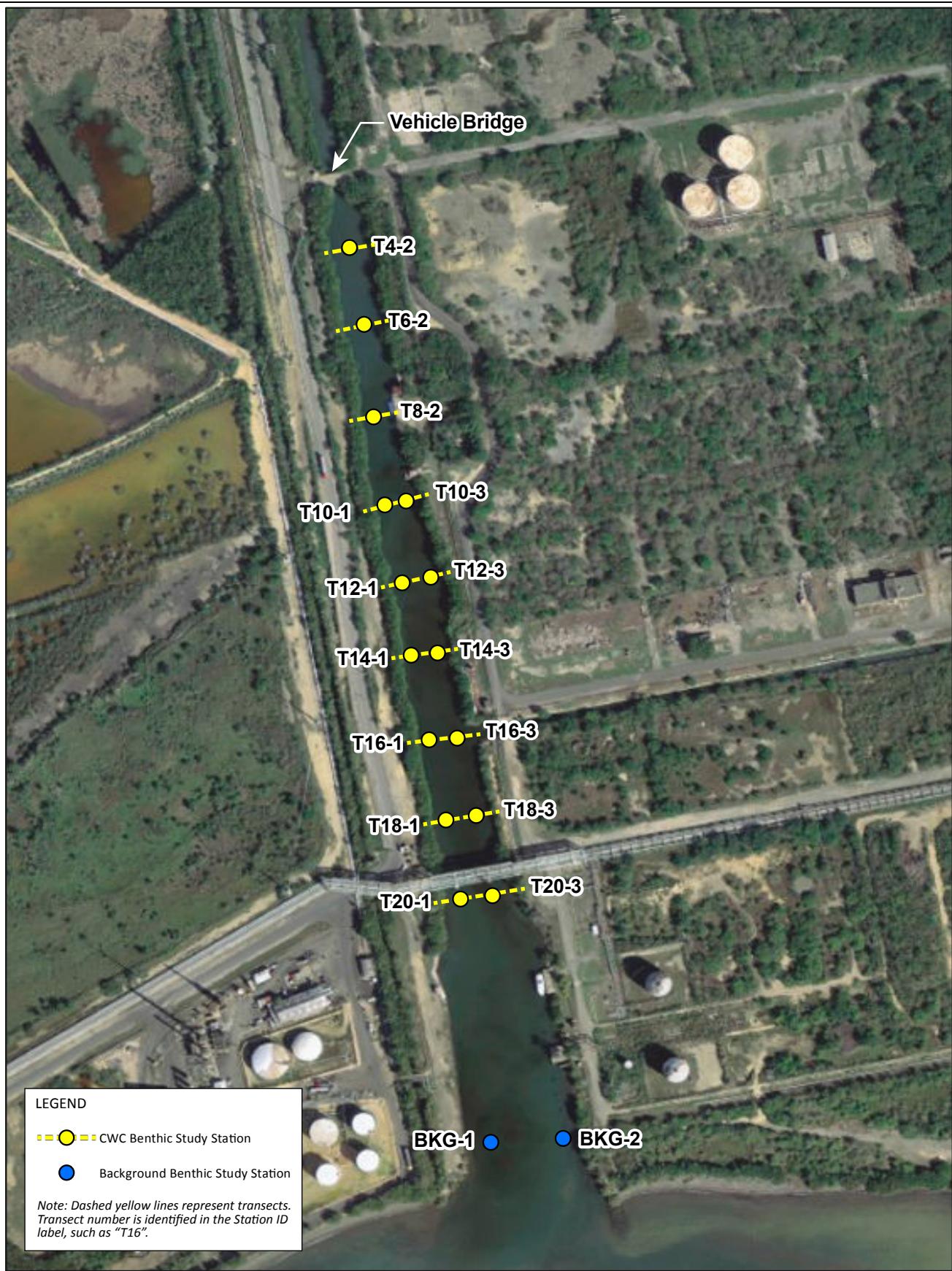


FIGURE 1
SWMU No. 5 Project Location
Benthic and Sediment Chemistry Sampling Stations
SWMU No. 5 Benthic Study Report
PTPLLC, Puerto Rico



0 100 200 300
Feet

FIGURE 2
Potential Benthic Risk at Previously Sampled Stations
SWMU No. 5 Benthic Study Report
PTPLLC, Puerto Rico



0 100 200 300
Feet

FIGURE 3
Cooling Water Canal
Benthic and Sediment Chemistry Sampling Stations
SWMU No. 5 Benthic Study Report
PTPLLC, Puerto Rico



N
0 100 200 300
Feet

FIGURE 4
Mangrove Embayment
Benthic and Sediment Chemistry Sampling Stations
SWMU No. 5 Benthic Study Report
PTPLLC, Puerto Rico

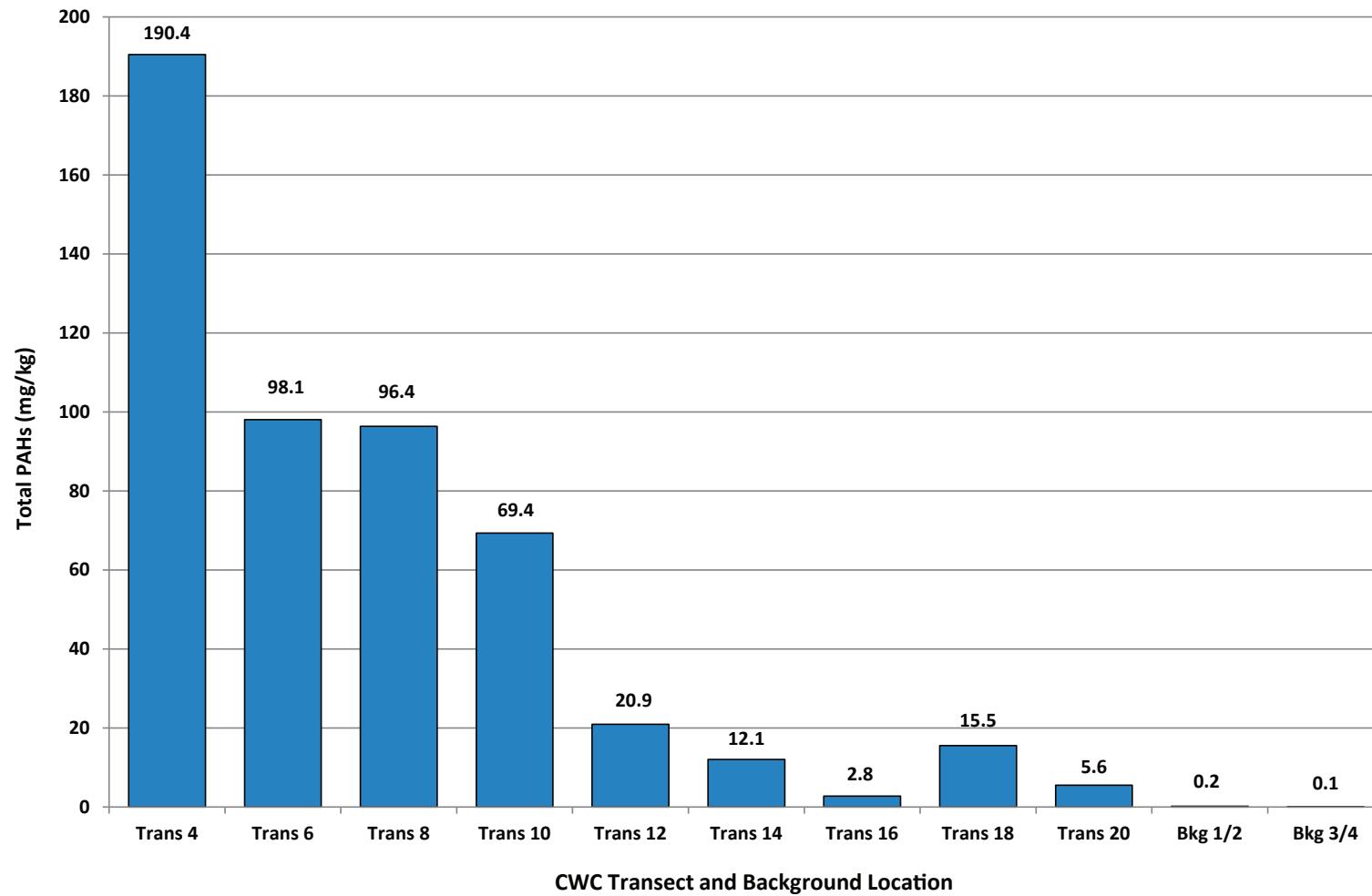


FIGURE 5
Total PAH Concentrations
CWC and Background
SWMU No. 5 Benthic Study Report
PTPLLC, Puerto Rico

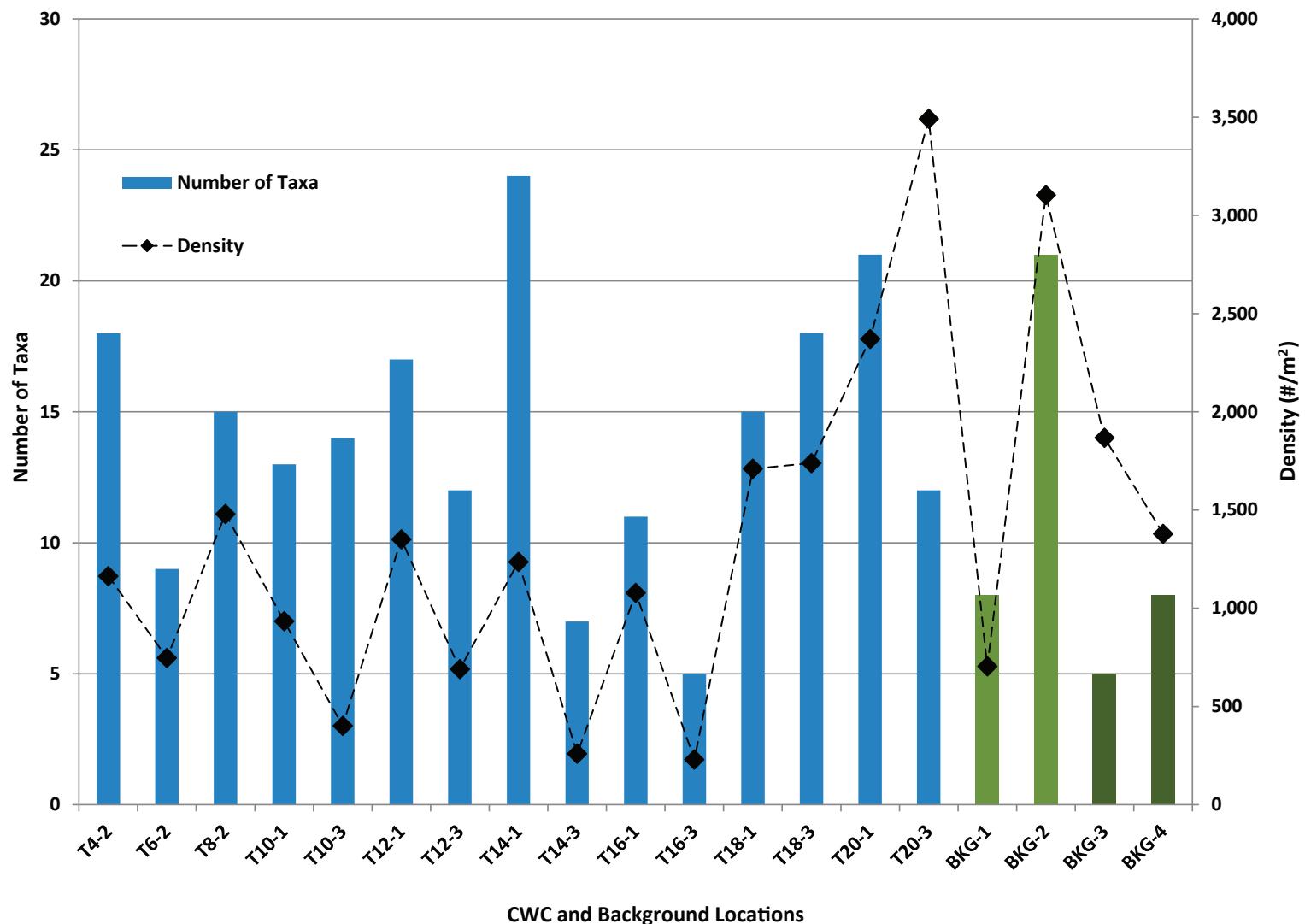


FIGURE 6
Benthic Macroinvertebrates
Number of Taxa and Density
SWMU No. 5 Benthic Study Report
PTPLLC, Puerto Rico

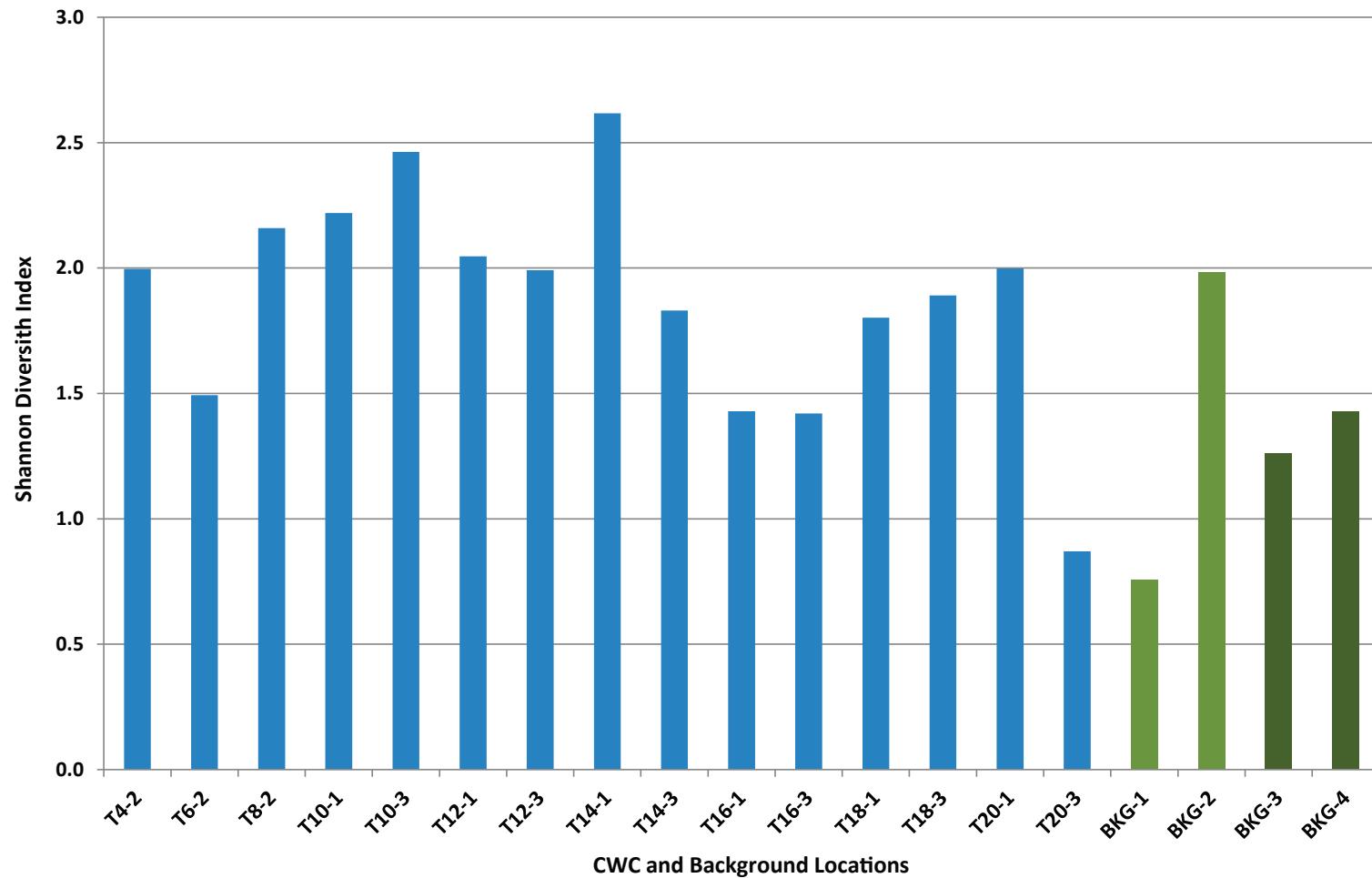


FIGURE 7
Benthic Macroinvertebrates
Shannon Diversity Index
SWMU No. 5 Benthic Study Report
PTPLLC, Puerto Rico

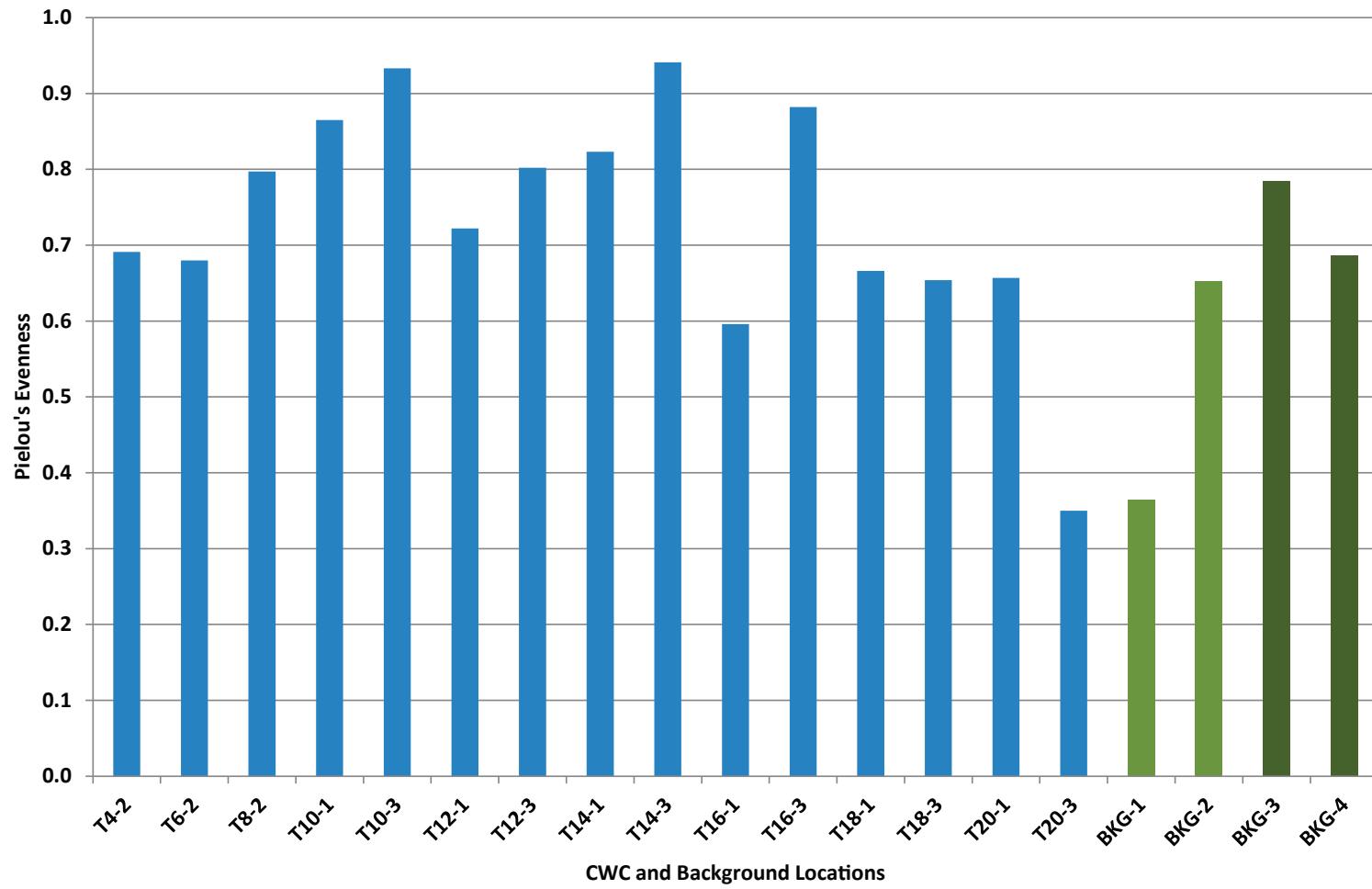


FIGURE 8
Benthic Macroinvertebrates
Pielou's Evenness
SWMU No. 5 Benthic Study Report
PTPLLC, Puerto Rico

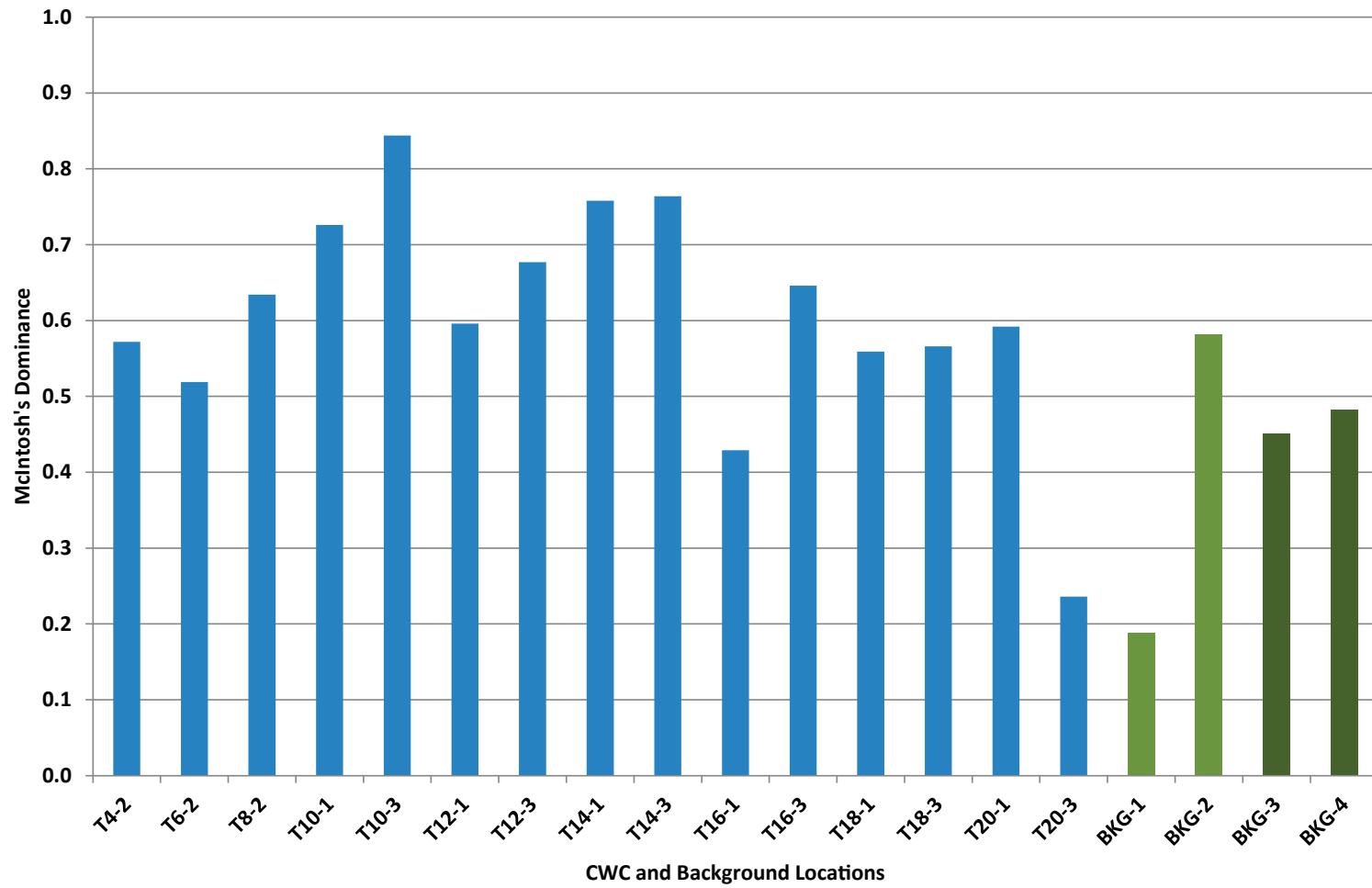


FIGURE 9
Benthic Macroinvertebrates
McIntosh's Dominance
SWMU No. 5 Benthic Study Report
PTPLLC, Puerto Rico

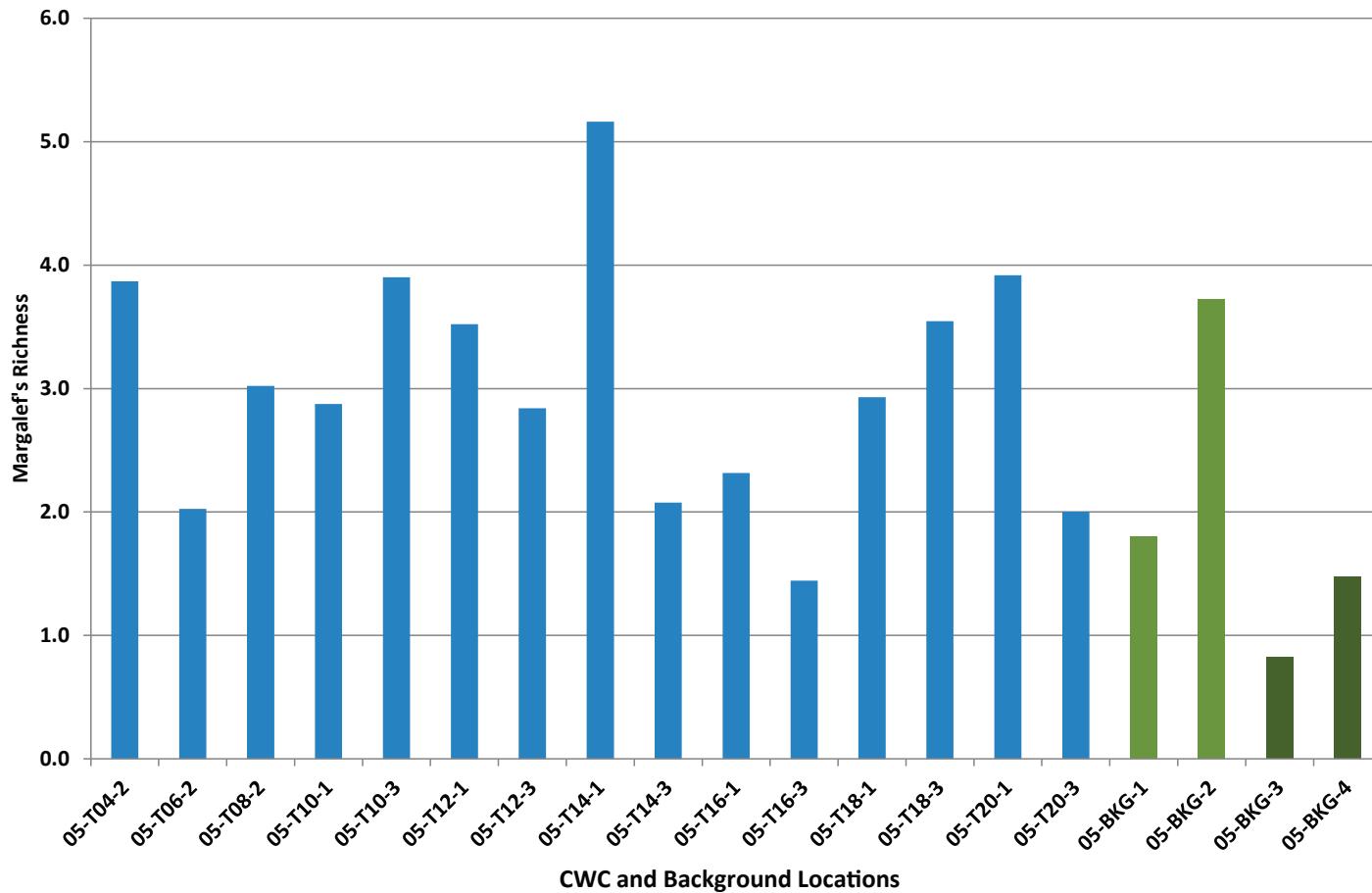


FIGURE 10
Benthic Macroinvertebrates
Margalef's Richness
SWMU No. 5 Benthic Study Report
PTPLLC, Puerto Rico

Appendix A

Laboratory Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

June 18, 2013

Project: DOW - SWMU 5

Submittal Date: 05/28/2013
Group Number: 1392839
SDG: RFI21
PO Number: 464392-02
Release Number: RFI21
State of Sample Origin: PR

<u>Client Sample Description</u>	<u>Lancaster Labs (LLI) #</u>
05-T04-SD2 Grab Sediment	7072138
05-T06-SD2 Grab Sediment	7072139
05-T08-SD2 Grab Sediment	7072140
05-T10-SD1 Grab Sediment	7072141
05-T10-SD3 Grab Sediment	7072142
05-T12-SD1 Grab Sediment	7072143
05-T12-SD3 Grab Sediment	7072144
05-T12-SD3 MS Grab Sediment	7072145
05-T12-SD3 MSD Grab Sediment	7072146
05-T12-SD3 DUP Grab Sediment	7072147
05-T14-SD1 Grab Sediment	7072148
05-T14-SD3 Grab Sediment	7072149
05-T16-SD1 Grab Sediment	7072150
05-T16-SD3 Grab Sediment	7072151
05-T18-SD1 Grab Sediment	7072152
05-T18-SD3 Grab Sediment	7072153
05-T20-SD1 Grab Sediment	7072154
05-T20-SD3 Grab Sediment	7072155
BKG-1 Grab Sediment	7072156
BKG-2 Grab Sediment	7072157
BKG-3 Grab Sediment	7072158
BKG-4 Grab Sediment	7072159
EB-1 Grab Water	7072160
EB-2 Grab Water	7072161
FB-1 Grab Water	7072162
FB-2 Grab Water	7072163
FD-1 Grab Sediment	7072164
FD-2 Grab Sediment	7072165

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO	CH2M Hill, Inc.	Attn: Chemistry Mailbox
ELECTRONIC COPY TO	CH2M Hill, Inc.	Attn: Ward Dickens
ELECTRONIC COPY TO	CH2M Hill, Inc.	Attn: David Lane

Respectfully Submitted,



Wendy A. Kozma
Principal Specialist Group Leader

(717) 556-7257

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: 05-T04-SD2 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072138
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 09:30 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S54S2 SDG#: RFI21-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles SW-846 8270C SIM					
10725	Acenaphthene	83-32-9	4,700	16	10
10725	Acenaphthylene	208-96-8	26,000	E 8.2	10
10725	Anthracene	120-12-7	9,100	E 8.2	10
10725	Benzo(a)anthracene	56-55-3	12,000	E 16	10
10725	Benzo(a)pyrene	50-32-8	10,000	E 16	10
10725	Benzo(b)fluoranthene	205-99-2	9,700	E 16	10
10725	Benzo(g,h,i)perylene	191-24-2	1,900	16	10
10725	Benzo(k)fluoranthene	207-08-9	2,600	16	10
10725	Chrysene	218-01-9	12,000	E 8.2	10
10725	Dibenz(a,h)anthracene	53-70-3	1,000	16	10
10725	Fluoranthene	206-44-0	15,000	E 16	10
10725	Fluorene	86-73-7	3,900	16	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	2,000	16	10
10725	1-Methylnaphthalene	90-12-0	870	16	10
10725	2-Methylnaphthalene	91-57-6	660	16	10
10725	Naphthalene	91-20-3	410	16	10
10725	Phenanthrene	85-01-8	6,400	16	10
10725	Pyrene	129-00-0	27,000	E 16	10
Trial ID: DL					
10725	Acenaphthene	83-32-9	5,700	160	100
10725	Acenaphthylene	208-96-8	38,000	82	100
10725	Anthracene	120-12-7	12,000	82	100
10725	Benzo(a)anthracene	56-55-3	15,000	160	100
10725	Benzo(a)pyrene	50-32-8	12,000	160	100
10725	Benzo(b)fluoranthene	205-99-2	11,000	160	100
10725	Benzo(g,h,i)perylene	191-24-2	1,900	160	100
10725	Benzo(k)fluoranthene	207-08-9	2,700	160	100
10725	Chrysene	218-01-9	14,000	82	100
10725	Dibenz(a,h)anthracene	53-70-3	1,000	160	100
10725	Fluoranthene	206-44-0	20,000	160	100
10725	Fluorene	86-73-7	5,200	160	100
10725	Indeno(1,2,3-cd)pyrene	193-39-5	2,100	160	100
10725	1-Methylnaphthalene	90-12-0	1,100	160	100
10725	2-Methylnaphthalene	91-57-6	770	160	100
10725	Naphthalene	91-20-3	450	160	100
10725	Phenanthrene	85-01-8	7,200	160	100
10725	Pyrene	129-00-0	44,000	160	100
Wet Chemistry Lloyd Kahn modified					
00383	TOC by Lloyd Kahn	n.a.	15,900	mg/kg	2,750
Wet Chemistry ASTM D422					
07103	75 mm	n.a.	100	% Passing	0.50
07103	37.5 mm	n.a.	100		1
07103	19 mm	n.a.	100		1
07103	4.75 mm	n.a.	100		1
07103	3.35 mm	n.a.	99.9		1
07103	2.36 mm	n.a.	99.8		1
07103	1.18 mm	n.a.	99.0		1
07103	0.6 mm	n.a.	97.4		1

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Sample Description: 05-T04-SD2 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072138
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 09:30 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S54S2 SDG#: RFI21-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry					
	ASTM D422		% Passing	% Passing	
07103	0.3 mm	n.a.	95.0	0.50	1
07103	0.15 mm	n.a.	90.2	0.50	1
07103	0.075 mm	n.a.	86.1	0.50	1
07103	0.064 mm	n.a.	83.0	0.50	1
07103	0.05 mm	n.a.	79.0	0.50	1
07103	0.02 mm	n.a.	63.0	0.50	1
07103	0.005 mm	n.a.	30.0	0.50	1
07103	0.002 mm	n.a.	20.0	0.50	1
07103	0.001 mm	n.a.	15.0	0.50	1
Wet Chemistry					
	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	59.5	0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

General Sample Comments

The sample containers for all analyses were received at the lab on 05/25/13 at 09:15.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 02:35	Mark A Clark	10
10725	SIM SVOA (microwave)	SW-846 8270C SIM	2-DL	13150SLE026	06/10/2013 04:42	Mark A Clark	100
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 19:30	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

Sample Description: 05-T06-SD2 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072139
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 09:55 by RG CH2M Hill, Inc.
PO Box 241329
Submitted: 05/28/2013 09:15 Denver CO 80224

Reported: 06/18/2013 12:47

S56S2 SDG#: RFI21-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles SW-846 8270C SIM					
10725	Acenaphthene	83-32-9	2,900	15	10
10725	Acenaphthylene	208-96-8	17,000	E 7.7	10
10725	Anthracene	120-12-7	5,100	7.7	10
10725	Benzo(a)anthracene	56-55-3	7,000	15	10
10725	Benzo(a)pyrene	50-32-8	5,900	15	10
10725	Benzo(b)fluoranthene	205-99-2	5,600	15	10
10725	Benzo(g,h,i)perylene	191-24-2	1,100	15	10
10725	Benzo(k)fluoranthene	207-08-9	1,400	15	10
10725	Chrysene	218-01-9	7,300	7.7	10
10725	Dibenz(a,h)anthracene	53-70-3	590	15	10
10725	Fluoranthene	206-44-0	7,900	E 15	10
10725	Fluorene	86-73-7	2,900	15	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	1,100	15	10
10725	1-Methylnaphthalene	90-12-0	880	15	10
10725	2-Methylnaphthalene	91-57-6	540	15	10
10725	Naphthalene	91-20-3	270	15	10
10725	Phenanthrene	85-01-8	4,600	15	10
10725	Pyrene	129-00-0	16,000	E 15	10
Trial ID: DL					
10725	Acenaphthene	83-32-9	2,700	150	100
10725	Acenaphthylene	208-96-8	20,000	77	100
10725	Anthracene	120-12-7	4,700	77	100
10725	Benzo(a)anthracene	56-55-3	7,700	150	100
10725	Benzo(a)pyrene	50-32-8	6,100	150	100
10725	Benzo(b)fluoranthene	205-99-2	5,700	150	100
10725	Benzo(g,h,i)perylene	191-24-2	1,300	150	100
10725	Benzo(k)fluoranthene	207-08-9	1,400	150	100
10725	Chrysene	218-01-9	8,100	77	100
10725	Dibenz(a,h)anthracene	53-70-3	580	150	100
10725	Fluoranthene	206-44-0	8,900	150	100
10725	Fluorene	86-73-7	2,700	150	100
10725	Indeno(1,2,3-cd)pyrene	193-39-5	1,300	150	100
10725	1-Methylnaphthalene	90-12-0	840	150	100
10725	2-Methylnaphthalene	91-57-6	600	150	100
10725	Naphthalene	91-20-3	270	J 150	100
10725	Phenanthrene	85-01-8	4,900	150	100
10725	Pyrene	129-00-0	22,000	150	100
Wet Chemistry Lloyd Kahn modified					
00383	TOC by Lloyd Kahn	n.a.	47,700	mg/kg	1
Wet Chemistry ASTM D422					
07103	75 mm	n.a.	100	% Passing	0.50
07103	37.5 mm	n.a.	100		1
07103	19 mm	n.a.	100		1
07103	4.75 mm	n.a.	99.9		1
07103	3.35 mm	n.a.	99.8		1
07103	2.36 mm	n.a.	99.8		1
07103	1.18 mm	n.a.	99.4		1
07103	0.6 mm	n.a.	98.6		1

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Sample Description: 05-T06-SD2 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072139
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 09:55 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S56S2 SDG#: RFI21-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry					
	ASTM D422		% Passing	% Passing	
07103	0.3 mm	n.a.	97.9	0.50	1
07103	0.15 mm	n.a.	97.1	0.50	1
07103	0.075 mm	n.a.	94.5	0.50	1
07103	0.064 mm	n.a.	91.0	0.50	1
07103	0.05 mm	n.a.	84.0	0.50	1
07103	0.02 mm	n.a.	61.0	0.50	1
07103	0.005 mm	n.a.	31.0	0.50	1
07103	0.002 mm	n.a.	20.0	0.50	1
07103	0.001 mm	n.a.	15.0	0.50	1
Wet Chemistry					
	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	56.6	0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

General Sample Comments

The sample containers for all analyses were received at the lab on 05/25/13 at 09:15.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 03:06	Mark A Clark	10
10725	SIM SVOA (microwave)	SW-846 8270C SIM	2-DL	13150SLE026	06/10/2013 05:13	Mark A Clark	100
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 19:40	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T08-SD2 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072140
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 10:15 by RG CH2M Hill, Inc.
PO Box 241329
Submitted: 05/28/2013 09:15 Denver CO 80224

Reported: 06/18/2013 12:47

S58S2 SDG#: RFI21-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles SW-846 8270C SIM					
10725	Acenaphthene	83-32-9	1,900	16	10
10725	Acenaphthylene	208-96-8	16,000	E 8.2	10
10725	Anthracene	120-12-7	5,300	8.2	10
10725	Benzo(a)anthracene	56-55-3	7,200	16	10
10725	Benzo(a)pyrene	50-32-8	6,200	16	10
10725	Benzo(b)fluoranthene	205-99-2	6,000	16	10
10725	Benzo(g,h,i)perylene	191-24-2	1,300	16	10
10725	Benzo(k)fluoranthene	207-08-9	1,600	16	10
10725	Chrysene	218-01-9	7,300	8.2	10
10725	Dibenz(a,h)anthracene	53-70-3	690	16	10
10725	Fluoranthene	206-44-0	8,800	E 16	10
10725	Fluorene	86-73-7	2,100	16	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	1,300	16	10
10725	1-Methylnaphthalene	90-12-0	490	16	10
10725	2-Methylnaphthalene	91-57-6	280	16	10
10725	Naphthalene	91-20-3	190	16	10
10725	Phenanthrene	85-01-8	4,500	16	10
10725	Pyrene	129-00-0	16,000	E 16	10
Trial ID: DL					
10725	Acenaphthene	83-32-9	1,700	160	100
10725	Acenaphthylene	208-96-8	17,000	82	100
10725	Anthracene	120-12-7	4,500	82	100
10725	Benzo(a)anthracene	56-55-3	8,100	160	100
10725	Benzo(a)pyrene	50-32-8	6,600	160	100
10725	Benzo(b)fluoranthene	205-99-2	6,300	160	100
10725	Benzo(g,h,i)perylene	191-24-2	1,500	160	100
10725	Benzo(k)fluoranthene	207-08-9	1,500	160	100
10725	Chrysene	218-01-9	8,200	82	100
10725	Dibenz(a,h)anthracene	53-70-3	700	160	100
10725	Fluoranthene	206-44-0	10,000	160	100
10725	Fluorene	86-73-7	2,400	160	100
10725	Indeno(1,2,3-cd)pyrene	193-39-5	1,500	160	100
10725	1-Methylnaphthalene	90-12-0	540	160	100
10725	2-Methylnaphthalene	91-57-6	450	160	100
10725	Naphthalene	91-20-3	240	J 160	100
10725	Phenanthrene	85-01-8	4,500	160	100
10725	Pyrene	129-00-0	23,000	160	100
Wet Chemistry Lloyd Kahn modified					
00383	TOC by Lloyd Kahn	n.a.	37,300	mg/kg	1,690
Wet Chemistry ASTM D422					
07103	75 mm	n.a.	100	% Passing	0.50
07103	37.5 mm	n.a.	100		1
07103	19 mm	n.a.	100		1
07103	4.75 mm	n.a.	99.6		1
07103	3.35 mm	n.a.	99.4		1
07103	2.36 mm	n.a.	99.2		1
07103	1.18 mm	n.a.	98.7		1
07103	0.6 mm	n.a.	98.1		1

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Sample Description: 05-T08-SD2 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072140
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 10:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S58S2 SDG#: RFI21-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry					
07103	ASTM D422		% Passing	% Passing	
0.3 mm	n.a.		97.6	0.50	1
0.15 mm	n.a.		96.9	0.50	1
0.075 mm	n.a.		94.3	0.50	1
0.064 mm	n.a.		93.0	0.50	1
0.05 mm	n.a.		86.0	0.50	1
0.02 mm	n.a.		66.0	0.50	1
0.005 mm	n.a.		34.0	0.50	1
0.002 mm	n.a.		23.0	0.50	1
0.001 mm	n.a.		18.0	0.50	1
Wet Chemistry					
00111	SM 2540 G-1997		%	%	
Moisture	n.a.		59.3	0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

General Sample Comments

The container for Grain Size was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for PAHs, moisture and TOC was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 03:38	Mark A Clark	10
10725	SIM SVOA (microwave)	SW-846 8270C SIM	2-DL	13150SLE026	06/11/2013 02:28	Mark A Clark	100
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 19:59	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

Sample Description: 05-T10-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072141
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 10:55 by RG

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5101 SDG#: RFI21-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	2,200	17	10
10725	Acenaphthylene	208-96-8	16,000	E 8.5	10
10725	Anthracene	120-12-7	5,600	8.5	10
10725	Benzo(a)anthracene	56-55-3	8,400	17	10
10725	Benzo(a)pyrene	50-32-8	6,600	17	10
10725	Benzo(b)fluoranthene	205-99-2	6,500	17	10
10725	Benzo(g,h,i)perylene	191-24-2	1,400	17	10
10725	Benzo(k)fluoranthene	207-08-9	2,000	17	10
10725	Chrysene	218-01-9	9,600	E 8.5	10
10725	Dibenz(a,h)anthracene	53-70-3	790	17	10
10725	Fluoranthene	206-44-0	12,000	E 17	10
10725	Fluorene	86-73-7	2,500	17	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	1,500	17	10
10725	1-Methylnaphthalene	90-12-0	200	17	10
10725	2-Methylnaphthalene	91-57-6	190	17	10
10725	Naphthalene	91-20-3	120	17	10
10725	Phenanthrene	85-01-8	4,900	17	10
10725	Pyrene	129-00-0	21,000	E 17	10
Trial ID: DL					
10725	Acenaphthene	83-32-9	2,200	170	100
10725	Acenaphthylene	208-96-8	18,000	85	100
10725	Anthracene	120-12-7	5,900	85	100
10725	Benzo(a)anthracene	56-55-3	10,000	170	100
10725	Benzo(a)pyrene	50-32-8	7,500	170	100
10725	Benzo(b)fluoranthene	205-99-2	7,800	170	100
10725	Benzo(g,h,i)perylene	191-24-2	1,500	170	100
10725	Benzo(k)fluoranthene	207-08-9	1,900	170	100
10725	Chrysene	218-01-9	11,000	85	100
10725	Dibenz(a,h)anthracene	53-70-3	730	170	100
10725	Fluoranthene	206-44-0	14,000	170	100
10725	Fluorene	86-73-7	2,400	170	100
10725	Indeno(1,2,3-cd)pyrene	193-39-5	1,500	170	100
10725	1-Methylnaphthalene	90-12-0	270	J 170	100
10725	2-Methylnaphthalene	91-57-6	170	U 170	100
10725	Naphthalene	91-20-3	170	U 170	100
10725	Phenanthrene	85-01-8	5,100	170	100
10725	Pyrene	129-00-0	32,000	170	100
Wet Chemistry					
00383	Lloyd Kahn modified	n.a.	mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	29,100	2,990	1
Wet Chemistry					
07103	ASTM D422	n.a.	% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	99.1	0.50	1
07103	3.35 mm	n.a.	98.9	0.50	1
07103	2.36 mm	n.a.	98.7	0.50	1
07103	1.18 mm	n.a.	98.0	0.50	1
07103	0.6 mm	n.a.	96.2	0.50	1

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Sample Description: 05-T10-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072141
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 10:55 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5101 SDG#: RFI21-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry					
	ASTM D422		% Passing	% Passing	
07103	0.3 mm	n.a.	91.8	0.50	1
07103	0.15 mm	n.a.	81.1	0.50	1
07103	0.075 mm	n.a.	73.1	0.50	1
07103	0.064 mm	n.a.	73.0	0.50	1
07103	0.05 mm	n.a.	70.5	0.50	1
07103	0.02 mm	n.a.	55.0	0.50	1
07103	0.005 mm	n.a.	36.5	0.50	1
07103	0.002 mm	n.a.	28.0	0.50	1
07103	0.001 mm	n.a.	20.5	0.50	1
Wet Chemistry					
	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	61.1	0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

General Sample Comments

The container for Grain Size was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for PAHs, moisture and TOC was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 04:10	Mark A Clark	10
10725	SIM SVOA (microwave)	SW-846 8270C SIM	2-DL	13150SLE026	06/11/2013 03:00	Mark A Clark	100
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 20:08	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T10-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072142
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 11:15 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5103 SDG#: RFI21-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles SW-846 8270C SIM					
10725	Acenaphthene	83-32-9	350	1.8	1
10725	Acenaphthylene	208-96-8	2,900	E 0.90	1
10725	Anthracene	120-12-7	1,300	E 0.90	1
10725	Benzo(a)anthracene	56-55-3	1,300	E 1.8	1
10725	Benzo(a)pyrene	50-32-8	1,200	E 1.8	1
10725	Benzo(b)fluoranthene	205-99-2	1,300	E 1.8	1
10725	Benzo(g,h,i)perylene	191-24-2	200	1.8	1
10725	Benzo(k)fluoranthene	207-08-9	400	1.8	1
10725	Chrysene	218-01-9	1,500	E 0.90	1
10725	Dibenz(a,h)anthracene	53-70-3	140	1.8	1
10725	Fluoranthene	206-44-0	1,700	E 1.8	1
10725	Fluorene	86-73-7	580	1.8	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	220	1.8	1
10725	1-Methylnaphthalene	90-12-0	68	1.8	1
10725	2-Methylnaphthalene	91-57-6	52	1.8	1
10725	Naphthalene	91-20-3	46	1.8	1
10725	Phenanthrene	85-01-8	650	1.8	1
10725	Pyrene	129-00-0	2,800	E 1.8	1
Trial ID: DL					
10725	Acenaphthene	83-32-9	340	18	10
10725	Acenaphthylene	208-96-8	3,600	9.0	10
10725	Anthracene	120-12-7	1,100	9.0	10
10725	Benzo(a)anthracene	56-55-3	1,700	18	10
10725	Benzo(a)pyrene	50-32-8	1,500	18	10
10725	Benzo(b)fluoranthene	205-99-2	1,400	18	10
10725	Benzo(g,h,i)perylene	191-24-2	320	18	10
10725	Benzo(k)fluoranthene	207-08-9	410	18	10
10725	Chrysene	218-01-9	1,800	9.0	10
10725	Dibenz(a,h)anthracene	53-70-3	160	18	10
10725	Fluoranthene	206-44-0	2,200	18	10
10725	Fluorene	86-73-7	450	18	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	320	18	10
10725	1-Methylnaphthalene	90-12-0	59	18	10
10725	2-Methylnaphthalene	91-57-6	72	18	10
10725	Naphthalene	91-20-3	55	18	10
10725	Phenanthrene	85-01-8	710	18	10
10725	Pyrene	129-00-0	4,800	18	10
Wet Chemistry Lloyd Kahn modified					
00383	TOC by Lloyd Kahn	n.a.	mg/kg	mg/kg	
		n.a.	25,300	2,450	1
Wet Chemistry ASTM D422					
07103	75 mm	n.a.	% Passing	% Passing	
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	99.9	0.50	1
07103	2.36 mm	n.a.	99.7	0.50	1
07103	1.18 mm	n.a.	99.6	0.50	1
07103	0.6 mm	n.a.	99.4	0.50	1

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Sample Description: 05-T10-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072142
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 11:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5103 SDG#: RFI21-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry					
07103	ASTM D422		% Passing	% Passing	
0.3 mm	n.a.		99.1	0.50	1
0.15 mm	n.a.		96.7	0.50	1
0.075 mm	n.a.		89.8	0.50	1
0.064 mm	n.a.		86.0	0.50	1
0.05 mm	n.a.		80.0	0.50	1
0.02 mm	n.a.		65.0	0.50	1
0.005 mm	n.a.		39.0	0.50	1
0.002 mm	n.a.		30.0	0.50	1
0.001 mm	n.a.		23.0	0.50	1
Wet Chemistry					
00111	SM 2540 G-1997		%	%	
Moisture	n.a.		63.3	0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

General Sample Comments

The container for Grain Size was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for PAHs, moisture and TOC was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 05:45	Mark A Clark	1
10725	SIM SVOA (microwave)	SW-846 8270C SIM	2-DL	13150SLE026	06/11/2013 03:31	Mark A Clark	10
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 20:16	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T12-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072143
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 13:00 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5121 SDG#: RFI21-06

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	330	18	10
10725	Acenaphthylene	208-96-8	3,000	9.1	10
10725	Anthracene	120-12-7	1,700	9.1	10
10725	Benzo(a)anthracene	56-55-3	1,500	18	10
10725	Benzo(a)pyrene	50-32-8	1,000	18	10
10725	Benzo(b)fluoranthene	205-99-2	1,500	18	10
10725	Benzo(g,h,i)perylene	191-24-2	240	18	10
10725	Benzo(k)fluoranthene	207-08-9	330	18	10
10725	Chrysene	218-01-9	2,200	9.1	10
10725	Dibenz(a,h)anthracene	53-70-3	120	18	10
10725	Fluoranthene	206-44-0	3,000	18	10
10725	Fluorene	86-73-7	1,100	18	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	280	18	10
10725	1-Methylnaphthalene	90-12-0	260	18	10
10725	2-Methylnaphthalene	91-57-6	200	18	10
10725	Naphthalene	91-20-3	92	18	10
10725	Phenanthrene	85-01-8	4,900	18	10
10725	Pyrene	129-00-0	4,700	18	10
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	17,300	3,050	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	99.9	0.50	1
07103	2.36 mm	n.a.	99.8	0.50	1
07103	1.18 mm	n.a.	99.7	0.50	1
07103	0.6 mm	n.a.	99.6	0.50	1
07103	0.3 mm	n.a.	99.5	0.50	1
07103	0.15 mm	n.a.	98.1	0.50	1
07103	0.075 mm	n.a.	92.1	0.50	1
07103	0.064 mm	n.a.	89.0	0.50	1
07103	0.05 mm	n.a.	83.0	0.50	1
07103	0.02 mm	n.a.	63.0	0.50	1
07103	0.005 mm	n.a.	40.0	0.50	1
07103	0.002 mm	n.a.	29.5	0.50	1
07103	0.001 mm	n.a.	20.5	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	63.4	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: 05-T12-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study**LLI Sample #** SW 7072143
LLI Group # 1392839
Account # 11372**Project Name:** DOW - SWMU 5

Collected: 05/22/2013 13:00 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5121 SDG#: RFI21-06

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 06:16	Mark A Clark	10
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 20:26	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T12-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072144
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 13:15 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5123 SDG#: RFI21-07BKG

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	100	2.0	1
10725	Acenaphthylene	208-96-8	760	0.99	1
10725	Anthracene	120-12-7	340	0.99	1
10725	Benzo(a)anthracene	56-55-3	280	2.0	1
10725	Benzo(a)pyrene	50-32-8	280	2.0	1
10725	Benzo(b)fluoranthene	205-99-2	320	2.0	1
10725	Benzo(g,h,i)perylene	191-24-2	100	2.0	1
10725	Benzo(k)fluoranthene	207-08-9	91	2.0	1
10725	Chrysene	218-01-9	390	0.99	1
10725	Dibenz(a,h)anthracene	53-70-3	42	2.0	1
10725	Fluoranthene	206-44-0	430	2.0	1
10725	Fluorene	86-73-7	160	2.0	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	87	2.0	1
10725	1-Methylnaphthalene	90-12-0	110	2.0	1
10725	2-Methylnaphthalene	91-57-6	110	2.0	1
10725	Naphthalene	91-20-3	200	2.0	1
10725	Phenanthrene	85-01-8	520	2.0	1
10725	Pyrene	129-00-0	820	2.0	1
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	17,300	3,120	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	99.8	0.50	1
07103	3.35 mm	n.a.	99.6	0.50	1
07103	2.36 mm	n.a.	99.2	0.50	1
07103	1.18 mm	n.a.	99.1	0.50	1
07103	0.6 mm	n.a.	99.1	0.50	1
07103	0.3 mm	n.a.	99.0	0.50	1
07103	0.15 mm	n.a.	98.9	0.50	1
07103	0.075 mm	n.a.	98.4	0.50	1
07103	0.064 mm	n.a.	96.0	0.50	1
07103	0.05 mm	n.a.	92.0	0.50	1
07103	0.02 mm	n.a.	78.0	0.50	1
07103	0.005 mm	n.a.	43.0	0.50	1
07103	0.002 mm	n.a.	35.0	0.50	1
07103	0.001 mm	n.a.	23.0	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	66.3	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: 05-T12-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study**LLI Sample #** SW 7072144
LLI Group # 1392839
Account # 11372**Project Name:** DOW - SWMU 5

Collected: 05/22/2013 13:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5123 SDG#: RFI21-07BKG

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 00:59	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 20:35	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T12-SD3 MS Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072145
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 13:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5123 SDG#: RFI21-07MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles SW-846 8270C SIM					
10725	Acenaphthene	83-32-9	170	2.0	1
10725	Acenaphthylene	208-96-8	770	0.99	1
10725	Anthracene	120-12-7	360	0.99	1
10725	Benzo(a)anthracene	56-55-3	330	2.0	1
10725	Benzo(a)pyrene	50-32-8	340	2.0	1
10725	Benzo(b)fluoranthene	205-99-2	380	2.0	1
10725	Benzo(g,h,i)perylene	191-24-2	160	2.0	1
10725	Benzo(k)fluoranthene	207-08-9	170	2.0	1
10725	Chrysene	218-01-9	440	0.99	1
10725	Dibenz(a,h)anthracene	53-70-3	110	2.0	1
10725	Fluoranthene	206-44-0	450	2.0	1
10725	Fluorene	86-73-7	240	2.0	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	150	2.0	1
10725	1-Methylnaphthalene	90-12-0	160	2.0	1
10725	2-Methylnaphthalene	91-57-6	150	2.0	1
10725	Naphthalene	91-20-3	170	2.0	1
10725	Phenanthrene	85-01-8	490	2.0	1
10725	Pyrene	129-00-0	790	2.0	1
Wet Chemistry Lloyd Kahn modified					
00383	TOC by Lloyd Kahn	n.a.	149,000	9,270	1
Wet Chemistry SM 2540 G-1997					
00118	Moisture	n.a.	66.3	0.50	1

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 01:31	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 20:48	James S Mathiot	1
00118	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T12-SD3 MSD Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072146
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 13:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5123 SDG#: RFI21-07MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles SW-846 8270C SIM					
10725	Acenaphthene	83-32-9	160	2.0	1
10725	Acenaphthylene	208-96-8	720	0.99	1
10725	Anthracene	120-12-7	370	0.99	1
10725	Benzo(a)anthracene	56-55-3	300	2.0	1
10725	Benzo(a)pyrene	50-32-8	310	2.0	1
10725	Benzo(b)fluoranthene	205-99-2	360	2.0	1
10725	Benzo(g,h,i)perylene	191-24-2	140	2.0	1
10725	Benzo(k)fluoranthene	207-08-9	160	2.0	1
10725	Chrysene	218-01-9	390	0.99	1
10725	Dibenz(a,h)anthracene	53-70-3	110	2.0	1
10725	Fluoranthene	206-44-0	410	2.0	1
10725	Fluorene	86-73-7	220	2.0	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	150	2.0	1
10725	1-Methylnaphthalene	90-12-0	150	2.0	1
10725	2-Methylnaphthalene	91-57-6	150	2.0	1
10725	Naphthalene	91-20-3	160	2.0	1
10725	Phenanthrene	85-01-8	430	2.0	1
10725	Pyrene	129-00-0	710	2.0	1
Wet Chemistry SM 2540 G-1997					
00118	Moisture	n.a.	%	%	
			66.3	0.50	1

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 02:03	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00118	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T12-SD3 DUP Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072147
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 13:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5123 SDG#: RFI21-07DUP

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry 00383	Lloyd Kahn modified TOC by Lloyd Kahn	n.a.	mg/kg 13,800	mg/kg 3,220	1
Wet Chemistry 07103	ASTM D422 75 mm	n.a.	% Passing 100	% Passing 0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	99.8	0.50	1
07103	3.35 mm	n.a.	99.6	0.50	1
07103	2.36 mm	n.a.	99.2	0.50	1
07103	1.18 mm	n.a.	99.1	0.50	1
07103	0.6 mm	n.a.	98.9	0.50	1
07103	0.3 mm	n.a.	98.8	0.50	1
07103	0.15 mm	n.a.	98.6	0.50	1
07103	0.075 mm	n.a.	97.9	0.50	1
07103	0.064 mm	n.a.	96.0	0.50	1
07103	0.05 mm	n.a.	92.0	0.50	1
07103	0.02 mm	n.a.	78.0	0.50	1
07103	0.005 mm	n.a.	43.0	0.50	1
07103	0.002 mm	n.a.	33.0	0.50	1
07103	0.001 mm	n.a.	23.0	0.50	1
Wet Chemistry 00118	SM 2540 G-1997 Moisture	n.a.	% 66.3	% 0.50	1
00121	Moisture Duplicate	n.a.	67.5	0.50	1

The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 21:47	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00118	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1
00121	Moisture Duplicate	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T14-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072148
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 13:50 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5141 SDG#: RFI21-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	290	13	10
10725	Acenaphthylene	208-96-8	3,500	6.7	10
10725	Anthracene	120-12-7	1,300	6.7	10
10725	Benzo(a)anthracene	56-55-3	2,100	13	10
10725	Benzo(a)pyrene	50-32-8	1,400	13	10
10725	Benzo(b)fluoranthene	205-99-2	1,600	13	10
10725	Benzo(g,h,i)perylene	191-24-2	350	13	10
10725	Benzo(k)fluoranthene	207-08-9	430	13	10
10725	Chrysene	218-01-9	2,300	6.7	10
10725	Dibenz(a,h)anthracene	53-70-3	180	13	10
10725	Fluoranthene	206-44-0	3,600	13	10
10725	Fluorene	86-73-7	780	13	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	350	13	10
10725	1-Methylnaphthalene	90-12-0	150	13	10
10725	2-Methylnaphthalene	91-57-6	110	13	10
10725	Naphthalene	91-20-3	79	13	10
10725	Phenanthrene	85-01-8	3,100	13	10
10725	Pyrene	129-00-0	6,200	13	10
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	15,900	1,340	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	98.3	0.50	1
07103	3.35 mm	n.a.	97.6	0.50	1
07103	2.36 mm	n.a.	96.8	0.50	1
07103	1.18 mm	n.a.	93.8	0.50	1
07103	0.6 mm	n.a.	88.1	0.50	1
07103	0.3 mm	n.a.	78.5	0.50	1
07103	0.15 mm	n.a.	62.0	0.50	1
07103	0.075 mm	n.a.	48.4	0.50	1
07103	0.064 mm	n.a.	46.0	0.50	1
07103	0.05 mm	n.a.	44.0	0.50	1
07103	0.02 mm	n.a.	37.0	0.50	1
07103	0.005 mm	n.a.	25.0	0.50	1
07103	0.002 mm	n.a.	19.5	0.50	1
07103	0.001 mm	n.a.	13.0	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	50.6	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: 05-T14-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study**LLI Sample #** SW 7072148
LLI Group # 1392839
Account # 11372**Project Name:** DOW - SWMU 5

Collected: 05/22/2013 13:50 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5141 SDG#: RFI21-08

General Sample Comments

The container for PAHs, moisture and TOC was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for Grain Size was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 06:48	Mark A Clark	10
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 21:56	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T14-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072149
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 14:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5143 SDG#: RFI21-09

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	80	2.0	1
10725	Acenaphthylene	208-96-8	780	0.99	1
10725	Anthracene	120-12-7	320	0.99	1
10725	Benzo(a)anthracene	56-55-3	220	2.0	1
10725	Benzo(a)pyrene	50-32-8	230	2.0	1
10725	Benzo(b)fluoranthene	205-99-2	270	2.0	1
10725	Benzo(g,h,i)perylene	191-24-2	57	2.0	1
10725	Benzo(k)fluoranthene	207-08-9	80	2.0	1
10725	Chrysene	218-01-9	280	0.99	1
10725	Dibenz(a,h)anthracene	53-70-3	27	2.0	1
10725	Fluoranthene	206-44-0	330	2.0	1
10725	Fluorene	86-73-7	140	2.0	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	54	2.0	1
10725	1-Methylnaphthalene	90-12-0	65	2.0	1
10725	2-Methylnaphthalene	91-57-6	71	2.0	1
10725	Naphthalene	91-20-3	110	2.0	1
10725	Phenanthrene	85-01-8	370	2.0	1
10725	Pyrene	129-00-0	670	2.0	1
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	21,500	2,830	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	99.8	0.50	1
07103	3.35 mm	n.a.	99.7	0.50	1
07103	2.36 mm	n.a.	99.4	0.50	1
07103	1.18 mm	n.a.	99.3	0.50	1
07103	0.6 mm	n.a.	99.2	0.50	1
07103	0.3 mm	n.a.	98.9	0.50	1
07103	0.15 mm	n.a.	98.8	0.50	1
07103	0.075 mm	n.a.	97.9	0.50	1
07103	0.064 mm	n.a.	95.0	0.50	1
07103	0.05 mm	n.a.	88.5	0.50	1
07103	0.02 mm	n.a.	72.5	0.50	1
07103	0.005 mm	n.a.	42.5	0.50	1
07103	0.002 mm	n.a.	32.0	0.50	1
07103	0.001 mm	n.a.	21.0	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	66.6	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: 05-T14-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study**LLI Sample #** SW 7072149
LLI Group # 1392839
Account # 11372**Project Name:** DOW - SWMU 5

Collected: 05/22/2013 14:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5143 SDG#: RFI21-09

General Sample Comments

The container for PAHs, moisture and TOC was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for Grain Size was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 07:20	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 22:05	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T16-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072150
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 14:35 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5161 SDG#: RFI21-10

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	44	2.0	1
10725	Acenaphthylene	208-96-8	770	0.99	1
10725	Anthracene	120-12-7	270	0.99	1
10725	Benzo(a)anthracene	56-55-3	170	2.0	1
10725	Benzo(a)pyrene	50-32-8	190	2.0	1
10725	Benzo(b)fluoranthene	205-99-2	210	2.0	1
10725	Benzo(g,h,i)perylene	191-24-2	65	2.0	1
10725	Benzo(k)fluoranthene	207-08-9	60	2.0	1
10725	Chrysene	218-01-9	220	0.99	1
10725	Dibenz(a,h)anthracene	53-70-3	23	2.0	1
10725	Fluoranthene	206-44-0	210	2.0	1
10725	Fluorene	86-73-7	100	2.0	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	52	2.0	1
10725	1-Methylnaphthalene	90-12-0	25	2.0	1
10725	2-Methylnaphthalene	91-57-6	27	2.0	1
10725	Naphthalene	91-20-3	31	2.0	1
10725	Phenanthrene	85-01-8	190	2.0	1
10725	Pyrene	129-00-0	460	2.0	1
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	29,500	2,240	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	99.8	0.50	1
07103	2.36 mm	n.a.	99.6	0.50	1
07103	1.18 mm	n.a.	99.4	0.50	1
07103	0.6 mm	n.a.	99.3	0.50	1
07103	0.3 mm	n.a.	99.1	0.50	1
07103	0.15 mm	n.a.	98.7	0.50	1
07103	0.075 mm	n.a.	97.6	0.50	1
07103	0.064 mm	n.a.	95.0	0.50	1
07103	0.05 mm	n.a.	89.0	0.50	1
07103	0.02 mm	n.a.	73.0	0.50	1
07103	0.005 mm	n.a.	43.0	0.50	1
07103	0.002 mm	n.a.	33.0	0.50	1
07103	0.001 mm	n.a.	23.0	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	66.2	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Description: 05-T16-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072150
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 14:35 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5161 SDG#: RFI21-10

General Sample Comments

The container for PAHs, moisture and TOC was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for Grain Size was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 07:51	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531A	05/30/2013 22:18	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T16-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072151
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 14:55 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5163 SDG#: RFI21-11

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	37	2.0	1
10725	Acenaphthylene	208-96-8	670	0.99	1
10725	Anthracene	120-12-7	230	0.99	1
10725	Benzo(a)anthracene	56-55-3	110	2.0	1
10725	Benzo(a)pyrene	50-32-8	140	2.0	1
10725	Benzo(b)fluoranthene	205-99-2	160	2.0	1
10725	Benzo(g,h,i)perylene	191-24-2	51	2.0	1
10725	Benzo(k)fluoranthene	207-08-9	47	2.0	1
10725	Chrysene	218-01-9	130	0.99	1
10725	Dibenz(a,h)anthracene	53-70-3	17	2.0	1
10725	Fluoranthene	206-44-0	140	2.0	1
10725	Fluorene	86-73-7	85	2.0	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	40	2.0	1
10725	1-Methylnaphthalene	90-12-0	25	2.0	1
10725	2-Methylnaphthalene	91-57-6	29	2.0	1
10725	Naphthalene	91-20-3	36	2.0	1
10725	Phenanthrene	85-01-8	160	2.0	1
10725	Pyrene	129-00-0	290	2.0	1
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	30,900	2,930	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	99.9	0.50	1
07103	3.35 mm	n.a.	99.7	0.50	1
07103	2.36 mm	n.a.	99.4	0.50	1
07103	1.18 mm	n.a.	99.3	0.50	1
07103	0.6 mm	n.a.	99.2	0.50	1
07103	0.3 mm	n.a.	99.1	0.50	1
07103	0.15 mm	n.a.	99.0	0.50	1
07103	0.075 mm	n.a.	98.6	0.50	1
07103	0.064 mm	n.a.	97.0	0.50	1
07103	0.05 mm	n.a.	94.0	0.50	1
07103	0.02 mm	n.a.	84.0	0.50	1
07103	0.005 mm	n.a.	50.5	0.50	1
07103	0.002 mm	n.a.	36.0	0.50	1
07103	0.001 mm	n.a.	25.0	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	66.8	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: 05-T16-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study**LLI Sample #** SW 7072151
LLI Group # 1392839
Account # 11372**Project Name:** DOW - SWMU 5

Collected: 05/22/2013 14:55 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5163 SDG#: RFI21-11

General Sample Comments

The container for PAHs, moisture and TOC was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for Grain Size was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 08:23	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531B	05/30/2013 22:54	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T18-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072152
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 15:10 by RG CH2M Hill, Inc.
PO Box 241329
Submitted: 05/28/2013 09:15 Denver CO 80224

Reported: 06/18/2013 12:47

S5181 SDG#: RFI21-12

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles SW-846 8270C SIM					
10725	Acenaphthene	83-32-9	100	1.5	1
10725	Acenaphthylene	208-96-8	1,500	0.77	1
10725	Anthracene	120-12-7	880	0.77	1
10725	Benzo(a)anthracene	56-55-3	850	1.5	1
10725	Benzo(a)pyrene	50-32-8	570	1.5	1
10725	Benzo(b)fluoranthene	205-99-2	990	1.5	1
10725	Benzo(g,h,i)perylene	191-24-2	150	1.5	1
10725	Benzo(k)fluoranthene	207-08-9	240	1.5	1
10725	Chrysene	218-01-9	1,300	0.77	1
10725	Dibenz(a,h)anthracene	53-70-3	71	1.5	1
10725	Fluoranthene	206-44-0	1,600	1.5	1
10725	Fluorene	86-73-7	410	1.5	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	150	1.5	1
10725	1-Methylnaphthalene	90-12-0	60	1.5	1
10725	2-Methylnaphthalene	91-57-6	57	1.5	1
10725	Naphthalene	91-20-3	39	1.5	1
10725	Phenanthrene	85-01-8	2,000	1.5	1
10725	Pyrene	129-00-0	2,100	1.5	1
Trial ID: DL					
10725	Acenaphthene	83-32-9	130	15	10
10725	Acenaphthylene	208-96-8	1,500	7.7	10
10725	Anthracene	120-12-7	780	7.7	10
10725	Benzo(a)anthracene	56-55-3	990	15	10
10725	Benzo(a)pyrene	50-32-8	630	15	10
10725	Benzo(b)fluoranthene	205-99-2	990	15	10
10725	Benzo(g,h,i)perylene	191-24-2	240	15	10
10725	Benzo(k)fluoranthene	207-08-9	240	15	10
10725	Chrysene	218-01-9	1,600	7.7	10
10725	Dibenz(a,h)anthracene	53-70-3	120	15	10
10725	Fluoranthene	206-44-0	1,900	15	10
10725	Fluorene	86-73-7	420	15	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	270	15	10
10725	1-Methylnaphthalene	90-12-0	61	15	10
10725	2-Methylnaphthalene	91-57-6	59	15	10
10725	Naphthalene	91-20-3	43	15	10
10725	Phenanthrene	85-01-8	2,700	15	10
10725	Pyrene	129-00-0	3,300	15	10
Wet Chemistry Lloyd Kahn modified					
00383	TOC by Lloyd Kahn	n.a.	16,200	2,750	1
Wet Chemistry ASTM D422					
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	99.8	0.50	1
07103	2.36 mm	n.a.	99.6	0.50	1
07103	1.18 mm	n.a.	98.9	0.50	1
07103	0.6 mm	n.a.	95.7	0.50	1

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Sample Description: 05-T18-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072152
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 15:10 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5181 SDG#: RFI21-12

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry					
	ASTM D422		% Passing	% Passing	
07103	0.3 mm	n.a.	88.5	0.50	1
07103	0.15 mm	n.a.	74.2	0.50	1
07103	0.075 mm	n.a.	68.1	0.50	1
07103	0.064 mm	n.a.	66.5	0.50	1
07103	0.05 mm	n.a.	63.0	0.50	1
07103	0.02 mm	n.a.	54.0	0.50	1
07103	0.005 mm	n.a.	31.5	0.50	1
07103	0.002 mm	n.a.	21.0	0.50	1
07103	0.001 mm	n.a.	13.0	0.50	1
Wet Chemistry					
	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	56.8	0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

General Sample Comments

The sample containers for all analyses were received at the lab on 05/25/13 at 09:15.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 08:55	Mark A Clark	1
10725	SIM SVOA (microwave)	SW-846 8270C SIM	2-DL	13150SLE026	06/11/2013 04:03	Mark A Clark	10
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531B	05/30/2013 23:03	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T18-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072153
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 15:30 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5183 SDG#: RFI21-13

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles SW-846 8270C SIM					
10725	Acenaphthene	83-32-9	430	1.7	1
10725	Acenaphthylene	208-96-8	2,200	E 0.84	1
10725	Anthracene	120-12-7	1,200	E 0.84	1
10725	Benzo(a)anthracene	56-55-3	910	E 1.7	1
10725	Benzo(a)pyrene	50-32-8	750	1.7	1
10725	Benzo(b)fluoranthene	205-99-2	750	1.7	1
10725	Benzo(g,h,i)perylene	191-24-2	110	1.7	1
10725	Benzo(k)fluoranthene	207-08-9	190	1.7	1
10725	Chrysene	218-01-9	970	E 0.84	1
10725	Dibenz(a,h)anthracene	53-70-3	68	1.7	1
10725	Fluoranthene	206-44-0	1,200	E 1.7	1
10725	Fluorene	86-73-7	610	1.7	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	120	1.7	1
10725	1-Methylnaphthalene	90-12-0	350	1.7	1
10725	2-Methylnaphthalene	91-57-6	230	1.7	1
10725	Naphthalene	91-20-3	120	1.7	1
10725	Phenanthrene	85-01-8	1,800	E 1.7	1
10725	Pyrene	129-00-0	1,900	E 1.7	1
Trial ID: DL					
10725	Acenaphthene	83-32-9	480	17	10
10725	Acenaphthylene	208-96-8	2,300	8.4	10
10725	Anthracene	120-12-7	940	8.4	10
10725	Benzo(a)anthracene	56-55-3	1,100	17	10
10725	Benzo(a)pyrene	50-32-8	830	17	10
10725	Benzo(b)fluoranthene	205-99-2	740	17	10
10725	Benzo(g,h,i)perylene	191-24-2	190	17	10
10725	Benzo(k)fluoranthene	207-08-9	210	17	10
10725	Chrysene	218-01-9	1,200	8.4	10
10725	Dibenz(a,h)anthracene	53-70-3	120	17	10
10725	Fluoranthene	206-44-0	1,300	17	10
10725	Fluorene	86-73-7	630	17	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	220	17	10
10725	1-Methylnaphthalene	90-12-0	370	17	10
10725	2-Methylnaphthalene	91-57-6	240	17	10
10725	Naphthalene	91-20-3	130	17	10
10725	Phenanthrene	85-01-8	2,100	17	10
10725	Pyrene	129-00-0	2,800	17	10
Wet Chemistry Lloyd Kahn modified					
00383	TOC by Lloyd Kahn	n.a.	mg/kg	mg/kg	
		n.a.	28,800	1,800	1
Wet Chemistry ASTM D422					
07103	75 mm	n.a.	% Passing	% Passing	
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	99.8	0.50	1
07103	2.36 mm	n.a.	99.6	0.50	1
07103	1.18 mm	n.a.	99.6	0.50	1
07103	0.6 mm	n.a.	99.2	0.50	1

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Sample Description: 05-T18-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072153
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 15:30 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5183 SDG#: RFI21-13

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry					
	ASTM D422		% Passing	% Passing	
07103	0.3 mm	n.a.	98.7	0.50	1
07103	0.15 mm	n.a.	97.2	0.50	1
07103	0.075 mm	n.a.	90.8	0.50	1
07103	0.064 mm	n.a.	88.0	0.50	1
07103	0.05 mm	n.a.	80.0	0.50	1
07103	0.02 mm	n.a.	62.0	0.50	1
07103	0.005 mm	n.a.	38.5	0.50	1
07103	0.002 mm	n.a.	29.0	0.50	1
07103	0.001 mm	n.a.	20.0	0.50	1
Wet Chemistry					
	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	60.6	0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

General Sample Comments

The sample containers for all analyses were received at the lab on 05/25/13 at 09:15.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 09:27	Mark A Clark	1
10725	SIM SVOA (microwave)	SW-846 8270C SIM	2-DL	13150SLE026	06/11/2013 04:35	Mark A Clark	10
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531B	05/30/2013 23:36	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T20-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072154
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 15:50 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5201 SDG#: RFI21-14

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles SW-846 8270C SIM					
10725	Acenaphthene	83-32-9	130	1.7	1
10725	Acenaphthylene	208-96-8	1,700	E 0.84	1
10725	Anthracene	120-12-7	580	0.84	1
10725	Benzo(a)anthracene	56-55-3	710	1.7	1
10725	Benzo(a)pyrene	50-32-8	580	1.7	1
10725	Benzo(b)fluoranthene	205-99-2	580	1.7	1
10725	Benzo(g,h,i)perylene	191-24-2	86	1.7	1
10725	Benzo(k)fluoranthene	207-08-9	190	1.7	1
10725	Chrysene	218-01-9	550	0.84	1
10725	Dibenz(a,h)anthracene	53-70-3	51	1.7	1
10725	Fluoranthene	206-44-0	510	1.7	1
10725	Fluorene	86-73-7	260	1.7	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	91	1.7	1
10725	1-Methylnaphthalene	90-12-0	29	1.7	1
10725	2-Methylnaphthalene	91-57-6	33	1.7	1
10725	Naphthalene	91-20-3	21	1.7	1
10725	Phenanthrene	85-01-8	210	1.7	1
10725	Pyrene	129-00-0	1,500	E 1.7	1
Trial ID: DL					
10725	Acenaphthene	83-32-9	180	17	10
10725	Acenaphthylene	208-96-8	1,700	8.4	10
10725	Anthracene	120-12-7	540	8.4	10
10725	Benzo(a)anthracene	56-55-3	770	17	10
10725	Benzo(a)pyrene	50-32-8	640	17	10
10725	Benzo(b)fluoranthene	205-99-2	580	17	10
10725	Benzo(g,h,i)perylene	191-24-2	150	17	10
10725	Benzo(k)fluoranthene	207-08-9	160	17	10
10725	Chrysene	218-01-9	640	8.4	10
10725	Dibenz(a,h)anthracene	53-70-3	96	17	10
10725	Fluoranthene	206-44-0	540	17	10
10725	Fluorene	86-73-7	260	17	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	170	17	10
10725	1-Methylnaphthalene	90-12-0	36	J 17	10
10725	2-Methylnaphthalene	91-57-6	38	J 17	10
10725	Naphthalene	91-20-3	27	J 17	10
10725	Phenanthrene	85-01-8	210	17	10
10725	Pyrene	129-00-0	2,000	17	10
Wet Chemistry Lloyd Kahn modified					
00383	TOC by Lloyd Kahn	n.a.	mg/kg	mg/kg	
		n.a.	16,100	3,500	1
Wet Chemistry ASTM D422					
07103	75 mm	n.a.	% Passing	% Passing	
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	99.8	0.50	1
07103	2.36 mm	n.a.	99.7	0.50	1
07103	1.18 mm	n.a.	99.5	0.50	1
07103	0.6 mm	n.a.	99.4	0.50	1
07103		n.a.	97.7	0.50	1

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Sample Description: 05-T20-SD1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072154
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 15:50 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5201 SDG#: RFI21-14

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry					
	ASTM D422		% Passing	% Passing	
07103	0.3 mm	n.a.	94.3	0.50	1
07103	0.15 mm	n.a.	86.2	0.50	1
07103	0.075 mm	n.a.	77.5	0.50	1
07103	0.064 mm	n.a.	75.0	0.50	1
07103	0.05 mm	n.a.	70.5	0.50	1
07103	0.02 mm	n.a.	56.5	0.50	1
07103	0.005 mm	n.a.	31.5	0.50	1
07103	0.002 mm	n.a.	23.0	0.50	1
07103	0.001 mm	n.a.	19.0	0.50	1
Wet Chemistry					
	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	60.7	0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

General Sample Comments

The container for PAHs, moisture and TOC was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for Grain Size was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 09:59	Mark A Clark	1
10725	SIM SVOA (microwave)	SW-846 8270C SIM	2-DL	13150SLE026	06/11/2013 05:07	Mark A Clark	10
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531B	05/30/2013 23:44	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: 05-T20-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072155
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/23/2013 08:20 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5203 SDG#: RFI21-15

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	51	1.4	1
10725	Acenaphthylene	208-96-8	680	0.72	1
10725	Anthracene	120-12-7	210	0.72	1
10725	Benzo(a)anthracene	56-55-3	190	1.4	1
10725	Benzo(a)pyrene	50-32-8	200	1.4	1
10725	Benzo(b)fluoranthene	205-99-2	210	1.4	1
10725	Benzo(g,h,i)perylene	191-24-2	34	1.4	1
10725	Benzo(k)fluoranthene	207-08-9	69	1.4	1
10725	Chrysene	218-01-9	220	0.72	1
10725	Dibenz(a,h)anthracene	53-70-3	19	1.4	1
10725	Fluoranthene	206-44-0	180	1.4	1
10725	Fluorene	86-73-7	110	1.4	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	35	1.4	1
10725	1-Methylnaphthalene	90-12-0	30	1.4	1
10725	2-Methylnaphthalene	91-57-6	32	1.4	1
10725	Naphthalene	91-20-3	27	1.4	1
10725	Phenanthrene	85-01-8	100	1.4	1
10725	Pyrene	129-00-0	420	1.4	1
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	19,200	3,710	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	100	0.50	1
07103	2.36 mm	n.a.	100	0.50	1
07103	1.18 mm	n.a.	99.9	0.50	1
07103	0.6 mm	n.a.	99.9	0.50	1
07103	0.3 mm	n.a.	99.5	0.50	1
07103	0.15 mm	n.a.	92.8	0.50	1
07103	0.075 mm	n.a.	77.3	0.50	1
07103	0.064 mm	n.a.	73.5	0.50	1
07103	0.05 mm	n.a.	67.0	0.50	1
07103	0.02 mm	n.a.	51.0	0.50	1
07103	0.005 mm	n.a.	31.0	0.50	1
07103	0.002 mm	n.a.	21.5	0.50	1
07103	0.001 mm	n.a.	16.5	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	54.1	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: 05-T20-SD3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072155
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/23/2013 08:20 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5203 SDG#: RFI21-15

General Sample Comments

The container for Grain Size was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for PAHs, moisture and TOC was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 10:30	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531B	05/31/2013 00:07	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002A	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: BKG-1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072156
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/23/2013 09:35 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5BK1 SDG#: RFI21-16

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	5.7	2.1	1
10725	Acenaphthylene	208-96-8	56	1.0	1
10725	Anthracene	120-12-7	17	1.0	1
10725	Benzo(a)anthracene	56-55-3	9.7	2.1	1
10725	Benzo(a)pyrene	50-32-8	12	2.1	1
10725	Benzo(b)fluoranthene	205-99-2	17	2.1	1
10725	Benzo(g,h,i)perylene	191-24-2	3.4 J	2.1	1
10725	Benzo(k)fluoranthene	207-08-9	4.5 J	2.1	1
10725	Chrysene	218-01-9	12	1.0	1
10725	Dibenz(a,h)anthracene	53-70-3	2.1 U	2.1	1
10725	Fluoranthene	206-44-0	12	2.1	1
10725	Fluorene	86-73-7	9.7	2.1	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	3.1 J	2.1	1
10725	1-Methylnaphthalene	90-12-0	3.6 J	2.1	1
10725	2-Methylnaphthalene	91-57-6	4.1 J	2.1	1
10725	Naphthalene	91-20-3	4.0 J	2.1	1
10725	Phenanthrene	85-01-8	10	2.1	1
10725	Pyrene	129-00-0	34	2.1	1
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	31,500	3,910	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	100	0.50	1
07103	2.36 mm	n.a.	100	0.50	1
07103	1.18 mm	n.a.	99.5	0.50	1
07103	0.6 mm	n.a.	99.0	0.50	1
07103	0.3 mm	n.a.	98.5	0.50	1
07103	0.15 mm	n.a.	98.0	0.50	1
07103	0.075 mm	n.a.	96.5	0.50	1
07103	0.064 mm	n.a.	95.0	0.50	1
07103	0.05 mm	n.a.	89.0	0.50	1
07103	0.02 mm	n.a.	71.0	0.50	1
07103	0.005 mm	n.a.	40.0	0.50	1
07103	0.002 mm	n.a.	29.5	0.50	1
07103	0.001 mm	n.a.	21.0	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	67.9	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: BKG-1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072156
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/23/2013 09:35 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5BK1 SDG#: RFI21-16

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/10/2013 11:02	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531B	05/31/2013 00:20	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002B	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: BKG-2 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072157
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/23/2013 08:55 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5BK2 SDG#: RFI21-17

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	2.1 U	2.1	1
10725	Acenaphthylene	208-96-8	22	1.1	1
10725	Anthracene	120-12-7	7.5	1.1	1
10725	Benzo(a)anthracene	56-55-3	8.9	2.1	1
10725	Benzo(a)pyrene	50-32-8	10	2.1	1
10725	Benzo(b)fluoranthene	205-99-2	13	2.1	1
10725	Benzo(g,h,i)perylene	191-24-2	5.4	2.1	1
10725	Benzo(k)fluoranthene	207-08-9	3.1 J	2.1	1
10725	Chrysene	218-01-9	10	1.1	1
10725	Dibenz(a,h)anthracene	53-70-3	2.1 U	2.1	1
10725	Fluoranthene	206-44-0	11	2.1	1
10725	Fluorene	86-73-7	5.5	2.1	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	4.4 J	2.1	1
10725	1-Methylnaphthalene	90-12-0	3.1 J	2.1	1
10725	2-Methylnaphthalene	91-57-6	2.8 J	2.1	1
10725	Naphthalene	91-20-3	5.0 J	2.1	1
10725	Phenanthrene	85-01-8	8.0	2.1	1
10725	Pyrene	129-00-0	30	2.1	1
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	36,900	2,750	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	100	0.50	1
07103	2.36 mm	n.a.	100	0.50	1
07103	1.18 mm	n.a.	99.4	0.50	1
07103	0.6 mm	n.a.	98.8	0.50	1
07103	0.3 mm	n.a.	98.3	0.50	1
07103	0.15 mm	n.a.	97.6	0.50	1
07103	0.075 mm	n.a.	96.6	0.50	1
07103	0.064 mm	n.a.	95.0	0.50	1
07103	0.05 mm	n.a.	91.0	0.50	1
07103	0.02 mm	n.a.	76.0	0.50	1
07103	0.005 mm	n.a.	41.0	0.50	1
07103	0.002 mm	n.a.	30.0	0.50	1
07103	0.001 mm	n.a.	21.0	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	68.7	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: BKG-2 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study**LLI Sample #** SW 7072157
LLI Group # 1392839
Account # 11372**Project Name:** DOW - SWMU 5

Collected: 05/23/2013 08:55 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5BK2 SDG#: RFI21-17

General Sample Comments

The container for PAHs, moisture and TOC was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for Grain Size was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/11/2013 00:20	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13150049531B	05/31/2013 01:17	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002B	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: BKG-3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072158
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/21/2013 11:30 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5BK3 SDG#: RFI21-18

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	2.9 U	2.9	1
10725	Acenaphthylene	208-96-8	1.7 J	1.5	1
10725	Anthracene	120-12-7	1.5 U	1.5	1
10725	Benzo(a)anthracene	56-55-3	2.9 U	2.9	1
10725	Benzo(a)pyrene	50-32-8	2.9 U	2.9	1
10725	Benzo(b)fluoranthene	205-99-2	2.9 U	2.9	1
10725	Benzo(g,h,i)perylene	191-24-2	2.9 U	2.9	1
10725	Benzo(k)fluoranthene	207-08-9	2.9 U	2.9	1
10725	Chrysene	218-01-9	1.5 U	1.5	1
10725	Dibenz(a,h)anthracene	53-70-3	2.9 U	2.9	1
10725	Fluoranthene	206-44-0	2.9 U	2.9	1
10725	Fluorene	86-73-7	2.9 U	2.9	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	2.9 U	2.9	1
10725	1-Methylnaphthalene	90-12-0	2.9 U	2.9	1
10725	2-Methylnaphthalene	91-57-6	2.9 U	2.9	1
10725	Naphthalene	91-20-3	2.9 U	2.9	1
10725	Phenanthrene	85-01-8	2.9 U	2.9	1
10725	Pyrene	129-00-0	4.0 J	2.9	1
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	122,000	10,200	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	96.4	0.50	1
07103	3.35 mm	n.a.	95.5	0.50	1
07103	2.36 mm	n.a.	94.5	0.50	1
07103	1.18 mm	n.a.	89.5	0.50	1
07103	0.6 mm	n.a.	80.6	0.50	1
07103	0.3 mm	n.a.	70.8	0.50	1
07103	0.15 mm	n.a.	61.9	0.50	1
07103	0.075 mm	n.a.	56.1	0.50	1
07103	0.064 mm	n.a.	54.0	0.50	1
07103	0.05 mm	n.a.	50.0	0.50	1
07103	0.02 mm	n.a.	37.0	0.50	1
07103	0.005 mm	n.a.	18.0	0.50	1
07103	0.002 mm	n.a.	15.0	0.50	1
07103	0.001 mm	n.a.	14.0	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	77.2	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: BKG-3 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072158
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/21/2013 11:30 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5BK3 SDG#: RFI21-18

General Sample Comments

The sample containers for all analyses were received at the lab on 05/25/13 at 09:15.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/11/2013 00:52	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13149049531A	05/30/2013 02:35	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002B	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: BKG-4 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072159
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/21/2013 12:15 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5BK4 SDG#: RFI21-19

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	3.1 U	3.1	1
10725	Acenaphthylene	208-96-8	8.5	1.5	1
10725	Anthracene	120-12-7	4.2 J	1.5	1
10725	Benzo(a)anthracene	56-55-3	4.5 J	3.1	1
10725	Benzo(a)pyrene	50-32-8	3.2 J	3.1	1
10725	Benzo(b)fluoranthene	205-99-2	5.5 J	3.1	1
10725	Benzo(g,h,i)perylene	191-24-2	3.4 J	3.1	1
10725	Benzo(k)fluoranthene	207-08-9	3.1 U	3.1	1
10725	Chrysene	218-01-9	4.9 J	1.5	1
10725	Dibenz(a,h)anthracene	53-70-3	3.1 U	3.1	1
10725	Fluoranthene	206-44-0	6.2 J	3.1	1
10725	Fluorene	86-73-7	3.1 U	3.1	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	3.1 U	3.1	1
10725	1-Methylnaphthalene	90-12-0	3.2 J	3.1	1
10725	2-Methylnaphthalene	91-57-6	3.8 J	3.1	1
10725	Naphthalene	91-20-3	5.6 J	3.1	1
10725	Phenanthrene	85-01-8	9.6	3.1	1
10725	Pyrene	129-00-0	11	3.1	1
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	131,000	8,130	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	99.6	0.50	1
07103	3.35 mm	n.a.	99.4	0.50	1
07103	2.36 mm	n.a.	98.9	0.50	1
07103	1.18 mm	n.a.	97.3	0.50	1
07103	0.6 mm	n.a.	92.6	0.50	1
07103	0.3 mm	n.a.	84.5	0.50	1
07103	0.15 mm	n.a.	75.1	0.50	1
07103	0.075 mm	n.a.	68.3	0.50	1
07103	0.064 mm	n.a.	67.5	0.50	1
07103	0.05 mm	n.a.	64.0	0.50	1
07103	0.02 mm	n.a.	49.0	0.50	1
07103	0.005 mm	n.a.	23.0	0.50	1
07103	0.002 mm	n.a.	21.0	0.50	1
07103	0.001 mm	n.a.	19.0	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	78.3	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: BKG-4 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study**LLI Sample #** SW 7072159
LLI Group # 1392839
Account # 11372**Project Name:** DOW - SWMU 5

Collected: 05/21/2013 12:15 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5BK4 SDG#: RFI21-19

General Sample Comments

The sample containers for all analyses were received at the lab on 05/25/13 at 09:15.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/11/2013 01:24	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13149049531A	05/30/2013 02:47	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710301A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002B	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: EB-1 Grab Water
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # WW 7072160
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/21/2013 09:20 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5EB1 SDG#: RFI21-20EB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/l	ug/l	
08357	Acenaphthene	83-32-9	0.011 U	0.011	1
08357	Acenaphthylene	208-96-8	0.011 U	0.011	1
08357	Anthracene	120-12-7	0.012 J	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.059	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.026 J	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.026 J	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.018 J	0.011	1
08357	Benzo(k)fluoranthene	207-08-9	0.011 U	0.011	1
08357	Chrysene	218-01-9	0.21	0.011	1
08357	Dibenz(a,h)anthracene	53-70-3	0.011 U	0.011	1
08357	Fluoranthene	206-44-0	0.035 J	0.011	1
08357	Fluorene	86-73-7	0.011 U	0.011	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	0.011 U	0.011	1
08357	1-Methylnaphthalene	90-12-0	0.011 U	0.011	1
08357	2-Methylnaphthalene	91-57-6	0.011 U	0.011	1
08357	Naphthalene	91-20-3	0.051 J	0.033	1
08357	Phenanthrene	85-01-8	0.061	0.033	1
08357	Pyrene	129-00-0	0.11	0.011	1
The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Sufficient sample was not available to repeat the analysis.					
Wet Chemistry	SM 5310 C-2000		mg/l	mg/l	
00273	Total Organic Carbon	n.a.	3.0	0.50	1

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13148WAG026	06/03/2013 22:38	Chad A Moline	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13148WAG026	05/28/2013 23:35	David V Hershey Jr	1
00273	Total Organic Carbon	SM 5310 C-2000	1	13154049507B	06/03/2013 03:28	James S Mathiot	1

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Sample Description: EB-2 Grab Water
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # WW 7072161
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/23/2013 09:20 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5EB2 SDG#: RFI21-21EB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/l	ug/l	
08357	Acenaphthene	83-32-9	0.011 U	0.011	1
08357	Acenaphthylene	208-96-8	0.011 U	0.011	1
08357	Anthracene	120-12-7	0.011 U	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.014 J	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.011 U	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.011 U	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.011 U	0.011	1
08357	Benzo(k)fluoranthene	207-08-9	0.011 U	0.011	1
08357	Chrysene	218-01-9	0.034 J	0.011	1
08357	Dibenz(a,h)anthracene	53-70-3	0.011 U	0.011	1
08357	Fluoranthene	206-44-0	0.014 J	0.011	1
08357	Fluorene	86-73-7	0.011 U	0.011	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	0.011 U	0.011	1
08357	1-Methylnaphthalene	90-12-0	0.011 U	0.011	1
08357	2-Methylnaphthalene	91-57-6	0.011 U	0.011	1
08357	Naphthalene	91-20-3	0.065	0.033	1
08357	Phenanthrene	85-01-8	0.033 U	0.033	1
08357	Pyrene	129-00-0	0.021 J	0.011	1
Wet Chemistry	SM 5310 C-2000		mg/l	mg/l	
00273	Total Organic Carbon	n.a.	17.1	0.50	1

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13148WAG026	06/03/2013 23:05	Chad A Moline	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13148WAG026	05/28/2013 23:35	David V Hershey Jr	1
00273	Total Organic Carbon	SM 5310 C-2000	2	13154049507B	06/06/2013 02:15	James S Mathiot	1

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Sample Description: FB-1 Grab Water
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # WW 7072162
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/21/2013 09:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5FB1 SDG#: RFI21-22FB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/l	ug/l	
08357	Acenaphthene	83-32-9	0.011 U	0.011	1
08357	Acenaphthylene	208-96-8	0.011 U	0.011	1
08357	Anthracene	120-12-7	0.011 U	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.011 U	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.011 U	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.011 U	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.011 U	0.011	1
08357	Benzo(k)fluoranthene	207-08-9	0.011 U	0.011	1
08357	Chrysene	218-01-9	0.011 U	0.011	1
08357	Dibenz(a,h)anthracene	53-70-3	0.011 U	0.011	1
08357	Fluoranthene	206-44-0	0.011 U	0.011	1
08357	Fluorene	86-73-7	0.011 U	0.011	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	0.011 U	0.011	1
08357	1-Methylnaphthalene	90-12-0	0.011 U	0.011	1
08357	2-Methylnaphthalene	91-57-6	0.011 U	0.011	1
08357	Naphthalene	91-20-3	0.057	0.033	1
08357	Phenanthrene	85-01-8	0.033 U	0.033	1
08357	Pyrene	129-00-0	0.011 U	0.011	1
Wet Chemistry	SM 5310 C-2000		mg/l	mg/l	
00273	Total Organic Carbon	n.a.	0.50 U	0.50	1

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13148WAG026	06/03/2013 23:32	Chad A Moline	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13148WAG026	05/28/2013 23:35	David V Hershey Jr	1
00273	Total Organic Carbon	SM 5310 C-2000	1	13154049507B	06/03/2013 03:55	James S Mathiot	1

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Sample Description: FB-2 Grab Water
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # WW 7072163
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/23/2013 09:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5FB2 SDG#: RFI21-23FB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/l	ug/l	
08357	Acenaphthene	83-32-9	0.011 U	0.011	1
08357	Acenaphthylene	208-96-8	0.011 U	0.011	1
08357	Anthracene	120-12-7	0.011 U	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.011 U	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.011 U	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.011 U	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.011 U	0.011	1
08357	Benzo(k)fluoranthene	207-08-9	0.011 U	0.011	1
08357	Chrysene	218-01-9	0.011 U	0.011	1
08357	Dibenz(a,h)anthracene	53-70-3	0.011 U	0.011	1
08357	Fluoranthene	206-44-0	0.011 U	0.011	1
08357	Fluorene	86-73-7	0.011 U	0.011	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	0.011 U	0.011	1
08357	1-Methylnaphthalene	90-12-0	0.011 U	0.011	1
08357	2-Methylnaphthalene	91-57-6	0.011 U	0.011	1
08357	Naphthalene	91-20-3	0.070	0.032	1
08357	Phenanthrene	85-01-8	0.032 U	0.032	1
08357	Pyrene	129-00-0	0.011 U	0.011	1
Wet Chemistry	SM 5310 C-2000		mg/l	mg/l	
00273	Total Organic Carbon	n.a.	0.50 U	0.50	1

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13148WAG026	06/03/2013 23:59	Chad A Moline	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13148WAG026	05/28/2013 23:35	David V Hershey Jr	1
00273	Total Organic Carbon	SM 5310 C-2000	1	13154049507B	06/03/2013 04:24	James S Mathiot	1

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Sample Description: FD-1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072164
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 13:00 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5FD1 SDG#: RFI21-24FD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles SW-846 8270C SIM					
10725	Acenaphthene	83-32-9	320	2.0	1
10725	Acenaphthylene	208-96-8	2,300	E 1.0	1
10725	Anthracene	120-12-7	1,500	E 1.0	1
10725	Benzo(a)anthracene	56-55-3	1,400	E 2.0	1
10725	Benzo(a)pyrene	50-32-8	1,100	E 2.0	1
10725	Benzo(b)fluoranthene	205-99-2	1,500	E 2.0	1
10725	Benzo(g,h,i)perylene	191-24-2	300	2.0	1
10725	Benzo(k)fluoranthene	207-08-9	420	2.0	1
10725	Chrysene	218-01-9	2,100	E 1.0	1
10725	Dibenz(a,h)anthracene	53-70-3	150	2.0	1
10725	Fluoranthene	206-44-0	2,500	E 2.0	1
10725	Fluorene	86-73-7	1,100	E 2.0	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	340	2.0	1
10725	1-Methylnaphthalene	90-12-0	310	2.0	1
10725	2-Methylnaphthalene	91-57-6	250	2.0	1
10725	Naphthalene	91-20-3	300	2.0	1
10725	Phenanthrene	85-01-8	3,600	E 2.0	1
10725	Pyrene	129-00-0	3,300	E 2.0	1
Trial ID: DL					
10725	Acenaphthene	83-32-9	400	20	10
10725	Acenaphthylene	208-96-8	3,300	10	10
10725	Anthracene	120-12-7	1,700	10	10
10725	Benzo(a)anthracene	56-55-3	1,800	20	10
10725	Benzo(a)pyrene	50-32-8	1,400	20	10
10725	Benzo(b)fluoranthene	205-99-2	1,800	20	10
10725	Benzo(g,h,i)perylene	191-24-2	370	20	10
10725	Benzo(k)fluoranthene	207-08-9	450	20	10
10725	Chrysene	218-01-9	2,700	10	10
10725	Dibenz(a,h)anthracene	53-70-3	210	20	10
10725	Fluoranthene	206-44-0	3,500	20	10
10725	Fluorene	86-73-7	1,200	20	10
10725	Indeno(1,2,3-cd)pyrene	193-39-5	410	20	10
10725	1-Methylnaphthalene	90-12-0	340	20	10
10725	2-Methylnaphthalene	91-57-6	280	20	10
10725	Naphthalene	91-20-3	330	20	10
10725	Phenanthrene	85-01-8	5,500	20	10
10725	Pyrene	129-00-0	5,900	20	10
Wet Chemistry Lloyd Kahn modified					
00383	TOC by Lloyd Kahn	n.a.	37,500	3,500	1
Wet Chemistry ASTM D422					
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	100	0.50	1
07103	2.36 mm	n.a.	100	0.50	1
07103	1.18 mm	n.a.	99.9	0.50	1
07103	0.6 mm	n.a.	99.8	0.50	1

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Sample Description: FD-1 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072164
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 13:00 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5FD1 SDG#: RFI21-24FD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry					
07103	ASTM D422		% Passing	% Passing	
0.3 mm	n.a.	99.3	0.50	1	
0.15 mm	n.a.	97.8	0.50	1	
0.075 mm	n.a.	92.2	0.50	1	
0.064 mm	n.a.	90.0	0.50	1	
0.05 mm	n.a.	84.0	0.50	1	
0.02 mm	n.a.	71.0	0.50	1	
0.005 mm	n.a.	46.0	0.50	1	
0.002 mm	n.a.	31.5	0.50	1	
0.001 mm	n.a.	21.5	0.50	1	
Wet Chemistry					
00111	SM 2540 G-1997	n.a.	%	%	
Moisture		67.5	0.50	1	
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

General Sample Comments

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLE026	06/11/2013 01:56	Mark A Clark	1
10725	SIM SVOA (microwave)	SW-846 8270C SIM	2-DL	13150SLE026	06/11/2013 05:38	Mark A Clark	10
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLE026	05/31/2013 08:20	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13149049531A	05/30/2013 03:00	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710302A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820002B	06/04/2013 19:31	Scott W Freisher	1

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Sample Description: FD-2 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072165
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 14:15 by RG

CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5FD2 SDG#: RFI21-25FD*

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/kg	ug/kg	
10725	Acenaphthene	83-32-9	85	2.0	1
10725	Acenaphthylene	208-96-8	780	0.99	1
10725	Anthracene	120-12-7	370	0.99	1
10725	Benzo(a)anthracene	56-55-3	230	2.0	1
10725	Benzo(a)pyrene	50-32-8	230	2.0	1
10725	Benzo(b)fluoranthene	205-99-2	300	2.0	1
10725	Benzo(g,h,i)perylene	191-24-2	47	2.0	1
10725	Benzo(k)fluoranthene	207-08-9	80	2.0	1
10725	Chrysene	218-01-9	280	0.99	1
10725	Dibenz(a,h)anthracene	53-70-3	23	2.0	1
10725	Fluoranthene	206-44-0	320	2.0	1
10725	Fluorene	86-73-7	160	2.0	1
10725	Indeno(1,2,3-cd)pyrene	193-39-5	48	2.0	1
10725	1-Methylnaphthalene	90-12-0	78	2.0	1
10725	2-Methylnaphthalene	91-57-6	90	2.0	1
10725	Naphthalene	91-20-3	120	2.0	1
10725	Phenanthrene	85-01-8	370	2.0	1
10725	Pyrene	129-00-0	660	2.0	1
Wet Chemistry	Lloyd Kahn modified		mg/kg	mg/kg	
00383	TOC by Lloyd Kahn	n.a.	22,800	4,550	1
Wet Chemistry	ASTM D422		% Passing	% Passing	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	99.9	0.50	1
07103	2.36 mm	n.a.	99.7	0.50	1
07103	1.18 mm	n.a.	99.6	0.50	1
07103	0.6 mm	n.a.	99.4	0.50	1
07103	0.3 mm	n.a.	99.2	0.50	1
07103	0.15 mm	n.a.	98.8	0.50	1
07103	0.075 mm	n.a.	98.1	0.50	1
07103	0.064 mm	n.a.	95.0	0.50	1
07103	0.05 mm	n.a.	86.0	0.50	1
07103	0.02 mm	n.a.	67.0	0.50	1
07103	0.005 mm	n.a.	50.0	0.50	1
07103	0.002 mm	n.a.	35.0	0.50	1
07103	0.001 mm	n.a.	26.0	0.50	1
Wet Chemistry	SM 2540 G-1997		%	%	
00111	Moisture	n.a.	66.5	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

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Sample Description: FD-2 Grab Sediment
DOW - PPTLLC SWMU 5 Benthic Study

LLI Sample # SW 7072165
LLI Group # 1392839
Account # 11372

Project Name: DOW - SWMU 5

Collected: 05/22/2013 14:15 by RG CH2M Hill, Inc.

PO Box 241329
Denver CO 80224

Submitted: 05/28/2013 09:15

Reported: 06/18/2013 12:47

S5FD2 SDG#: RFI21-25FD*

General Sample Comments

The container for PAHs, moisture and TOC was received at the lab on 05/25/13 at 09:15.

The temperature of the temperature blank bottle(s) upon receipt at the lab was >10.0 C using a Hg thermometer. The sample bottles were then measured using an IR thermometer and were recorded at 16.3 - 16.7 C. The container for Grain Size was received at elevated temperature.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10725	SIM SVOA (microwave)	SW-846 8270C SIM	1	13150SLF026	06/04/2013 13:12	Mark A Clark	1
10811	BNA Soil Microwave SIM	SW-846 3546	1	13150SLF026	05/31/2013 08:10	Katheryne V Sponheimer	1
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	13149049531A	05/30/2013 03:08	James S Mathiot	1
07103	Grain Size to 1 um	ASTM D422	1	13148710302A	05/28/2013 21:30	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	13155820001A	06/04/2013 20:31	Scott W Freisher	1

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 06/18/13 at 12:47 PM

Group Number: 1392839

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: 13148WAG026			Sample number(s): 7072160-7072163					
Acenaphthene	0.010	U	0.010	ug/l	105	65-124		
Acenaphthylene	0.010	U	0.010	ug/l	111	72-113		
Anthracene	0.010	U	0.010	ug/l	111	70-117		
Benzo(a)anthracene	0.010	U	0.010	ug/l	117*	75-115		
Benzo(a)pyrene	0.010	U	0.010	ug/l	111	72-120		
Benzo(b)fluoranthene	0.010	U	0.010	ug/l	119	74-130		
Benzo(g,h,i)perylene	0.010	U	0.010	ug/l	125*	63-121		
Benzo(k)fluoranthene	0.010	U	0.010	ug/l	122*	74-118		
Chrysene	0.010	U	0.010	ug/l	112	75-112		
Dibenz(a,h)anthracene	0.010	U	0.010	ug/l	122	66-122		
Fluoranthene	0.010	U	0.010	ug/l	112	73-116		
Fluorene	0.010	U	0.010	ug/l	106	74-115		
Indeno(1,2,3-cd)pyrene	0.010	U	0.010	ug/l	125*	66-122		
1-Methylnaphthalene	0.010	U	0.010	ug/l	112	72-114		
2-Methylnaphthalene	0.010	U	0.010	ug/l	111	74-119		
Naphthalene	0.030	U	0.030	ug/l	107	67-118		
Phenanthrene	0.030	U	0.030	ug/l	106	72-109		
Pyrene	0.010	U	0.010	ug/l	115	71-116		
Batch number: 13150SLE026			Sample number(s): 7072138-7072146, 7072148-7072159, 7072164					
Acenaphthene	0.67	U	0.67	ug/kg	94	69-114		
Acenaphthylene	0.33	U	0.33	ug/kg	95	71-113		
Anthracene	0.33	U	0.33	ug/kg	95	75-116		
Benzo(a)anthracene	0.67	U	0.67	ug/kg	102	76-115		
Benzo(a)pyrene	0.67	U	0.67	ug/kg	104	76-117		
Benzo(b)fluoranthene	0.67	U	0.67	ug/kg	114	77-129		
Benzo(g,h,i)perylene	0.67	U	0.67	ug/kg	106	64-120		
Benzo(k)fluoranthene	0.67	U	0.67	ug/kg	101	71-120		
Chrysene	0.33	U	0.33	ug/kg	102	78-111		
Dibenz(a,h)anthracene	0.67	U	0.67	ug/kg	105	65-124		
Fluoranthene	0.67	U	0.67	ug/kg	101	68-119		
Fluorene	0.67	U	0.67	ug/kg	112	75-123		
Indeno(1,2,3-cd)pyrene	0.67	U	0.67	ug/kg	112	66-122		
1-Methylnaphthalene	0.67	U	0.67	ug/kg	101	74-113		
2-Methylnaphthalene	0.67	U	0.67	ug/kg	97	78-121		
Naphthalene	0.67	U	0.67	ug/kg	92	64-120		
Phenanthrene	0.67	U	0.67	ug/kg	88	72-110		
Pyrene	0.67	U	0.67	ug/kg	98	71-120		
Batch number: 13150SLF026			Sample number(s): 7072165					
Acenaphthene	0.67	U	0.67	ug/kg	94	69-114		
Acenaphthylene	0.33	U	0.33	ug/kg	98	71-113		
Anthracene	0.33	U	0.33	ug/kg	95	75-116		

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: CH2M Hill, Inc.

Reported: 06/18/13 at 12:47 PM

Group Number: 1392839

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Benzo(a)anthracene	0.67	U	0.67	ug/kg	101	76-115		
Benzo(a)pyrene	0.67	U	0.67	ug/kg	97	76-117		
Benzo(b)fluoranthene	0.67	U	0.67	ug/kg	102	77-129		
Benzo(g,h,i)perylene	0.67	U	0.67	ug/kg	101	64-120		
Benzo(k)fluoranthene	0.67	U	0.67	ug/kg	98	71-120		
Chrysene	0.33	U	0.33	ug/kg	96	78-111		
Dibenz(a,h)anthracene	0.67	U	0.67	ug/kg	102	65-124		
Fluoranthene	0.67	U	0.67	ug/kg	102	68-119		
Fluorene	0.67	U	0.67	ug/kg	109	75-123		
Indeno(1,2,3-cd)pyrene	0.67	U	0.67	ug/kg	103	66-122		
1-Methylnaphthalene	0.67	U	0.67	ug/kg	101	74-113		
2-Methylnaphthalene	0.67	U	0.67	ug/kg	102	78-121		
Naphthalene	0.67	U	0.67	ug/kg	94	64-120		
Phenanthrene	0.67	U	0.67	ug/kg	85	72-110		
Pyrene	0.67	U	0.67	ug/kg	93	71-120		
Batch number: 13149049531A			Sample number(s): 7072158-7072159, 7072164-7072165					
TOC by Lloyd Kahn	100	U	100.	mg/kg	110	47-143		
Batch number: 13150049531A			Sample number(s): 7072138-7072145, 7072147-7072150					
TOC by Lloyd Kahn	100	U	100.	mg/kg	105	47-143		
Batch number: 13150049531B			Sample number(s): 7072151-7072157					
TOC by Lloyd Kahn	100	U	100.	mg/kg	105	47-143		
Batch number: 13154049507B			Sample number(s): 7072160-7072163					
Total Organic Carbon	0.50	U	0.50	mg/l	103	91-113		
Batch number: 13155820001A			Sample number(s): 7072165					
Moisture				100		99-101		
Batch number: 13155820002A			Sample number(s): 7072138-7072155					
Moisture				100		99-101		
Moisture				100		99-101		
Moisture Duplicate				100		99-101		
Batch number: 13155820002B			Sample number(s): 7072156-7072159, 7072164					
Moisture				100		99-101		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>BKG MAX</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: 13148WAG026			Sample number(s): 7072160-7072163 UNSPK: P071670					
Acenaphthene	110	110	59-127	1	30			
Acenaphthylene	115	115	33-146	1	30			
Anthracene	115	115	69-119	1	30			
Benzo(a)anthracene	135*	136*	67-124	1	30			
Benzo(a)pyrene	105	101	64-123	3	30			
Benzo(b)fluoranthene	126	119	61-133	5	30			

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 06/18/13 at 12:47 PM

Group Number: 1392839

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	MS <u>%REC</u>	MSD <u>%REC</u>	MS/MSD <u>Limits</u>	RPD <u>MAX</u>	BKG <u>Conc</u>	DUP <u>Conc</u>	DUP <u>RPD</u>	Dup RPD <u>Max</u>
Benzo(g,h,i)perylene	127	119	36-138	6	30			
Benzo(k)fluoranthene	110	102	59-128	7	30			
Chrysene	113	113	62-118	1	30			
Dibenz(a,h)anthracene	121	112	32-141	7	30			
Fluoranthene	114	115	65-123	2	30			
Fluorene	113	113	69-124	1	30			
Indeno(1,2,3-cd)pyrene	125	117	29-143	7	30			
1-Methylnaphthalene	117	117	67-117	1	30			
2-Methylnaphthalene	117	117	71-126	1	30			
Naphthalene	132*	128	58-131	3	30			
Phenanthrene	115	117	67-117	2	30			
Pyrene	139*	140*	59-125	2	30			
Batch number: 13150SLE026			Sample number(s): 7072138-7072146, 7072148-7072159, 7072164 UNSPK: 7072144					
Acenaphthene	67	65	48-127	1	30			
Acenaphthylene	6 (2)	-40 (2)	49-121	6	30			
Anthracene	22*	23*	52-126	0	30			
Benzo(a)anthracene	47	20*	32-135	9	30			
Benzo(a)pyrene	58	27*	36-138	9	30			
Benzo(b)fluoranthene	68	45	26-142	6	30			
Benzo(g,h,i)perylene	58	45	33-141	8	30			
Benzo(k)fluoranthene	77	70	47-129	4	30			
Chrysene	43	0*	29-148	10	30			
Dibenz(a,h)anthracene	72	70	34-125	1	30			
Fluoranthene	21 (2)	-17 (2)	47-135	9	30			
Fluorene	83	60	50-129	10	30			
Indeno(1,2,3-cd)pyrene	67	59	17-136	5	30			
1-Methylnaphthalene	42*	34*	50-131	6	30			
2-Methylnaphthalene	37	32	28-144	3	30			
Naphthalene	-28*	-45*	31-148	10	30			
Phenanthrene	-33 (2)	-96 (2)	29-142	14	30			
Pyrene	-33 (2)	-115	26-143	11	30			
		(2)						
Batch number: 13150SLF026			Sample number(s): 7072165 UNSPK: P071341					
Acenaphthene	107	100	48-127	7	30			
Acenaphthylene	101	103	49-121	1	30			
Anthracene	93	106	52-126	10	30			
Benzo(a)anthracene	85	117	32-135	16	30			
Benzo(a)pyrene	67	106	36-138	18	30			
Benzo(b)fluoranthene	16*	101	26-142	27	30			
Benzo(g,h,i)perylene	24*	60	33-141	25	30			
Benzo(k)fluoranthene	74	130*	47-129	27	30			
Chrysene	32	82	29-148	16	30			
Dibenz(a,h)anthracene	55	63	34-125	9	30			
Fluoranthene	42*	155*	47-135	32*	30			
Fluorene	112	122	50-129	6	30			
Indeno(1,2,3-cd)pyrene	47	69	17-136	18	30			
1-Methylnaphthalene	110	144*	50-131	18	30			
2-Methylnaphthalene	112	169*	28-144	23	30			
Naphthalene	90	109	31-148	14	30			
Phenanthrene	35	97	29-142	22	30			

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 06/18/13 at 12:47 PM

Group Number: 1392839

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>BKG MAX</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Pyrene	39	120	26-143	24	30			
Batch number: 13149049531A TOC by Lloyd Kahn			Sample number(s): 7072158-7072159, 7072164-7072165 99 22-155		UNSPK: P068142 BKG: P068142 23,100 25,800 11 15			
Batch number: 13150049531A TOC by Lloyd Kahn			Sample number(s): 7072138-7072145, 7072147-7072150 47 22-155		UNSPK: 7072144 BKG: 7072144 5,830 4,660 22* (1) 15			
Batch number: 13150049531B TOC by Lloyd Kahn			Sample number(s): 7072151-7072157 UNSPK: 7072157 BKG: 7072157 97 22-155		11,600 13,100 12 (1) 15			
Batch number: 13154049507B Total Organic Carbon			Sample number(s): 7072160-7072163 UNSPK: P073551 BKG: P073551 108 63-142		0.50 U 0.50 U 0 (1) 4			
Batch number: 13148710301A 75 mm 37.5 mm 19 mm 4.75 mm 3.35 mm 2.36 mm 1.18 mm 0.6 mm 0.3 mm 0.15 mm 0.075 mm 0.064 mm 0.05 mm 0.02 mm 0.005 mm 0.002 mm 0.001 mm			Sample number(s): 7072138-7072144, 7072147-7072159 BKG: 7072144 100 100 0 100 100 0 100 100 0 99.8 99.8 0 99.6 99.6 0 99.2 99.2 0 99.1 99.1 0 99.1 98.9 0 99.0 98.8 0 98.9 98.6 0 98.4 97.9 0 96.0 96.0 0 92.0 92.0 0 78.0 78.0 0 43.0 43.0 0 35.0 33.0 6 23.0 23.0 0					20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
Batch number: 13155820001A Moisture			Sample number(s): 7072165 BKG: P071370 16.0		24.1	40*		13
Batch number: 13155820002A Moisture Moisture Moisture Duplicate			Sample number(s): 7072138-7072155 BKG: 7072144 66.3 66.3 66.3		67.5 67.5 67.5	2 2 2		13 15 15
Batch number: 13155820002B Moisture			Sample number(s): 7072156-7072159, 7072164 BKG: 7072164 67.5		67.0	1		13

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 06/18/13 at 12:47 PM

Group Number: 1392839

Surrogate Quality Control

Analysis Name: PAHs in waters by SIM
Batch number: 13148WAG026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
--	------------------	--------------------	-------------------------

7072160	94	123	108
7072161	110	123	107
7072162	109	119	105
7072163	109	122	105
Blank	108	122	108
LCS	109	126	113
MS	110	123	115
MSD	109	116	114

Limits: 64-120 62-141 58-134

Analysis Name: SIM SVOA (microwave)
Batch number: 13150SLE026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
--	------------------	--------------------	-------------------------

7072138	126	111	114
7072138	134*	110	117
DL			
7072139	110	107	105
7072139	106	120	109
DL			
7072140	118	107	124
7072140	111	107	122
DL			
7072141	126	111	122
7072141	118	130	121
DL			
7072142	90	79	95
7072142	93	91	100
DL			
7072143	110	98	117
7072144	83	69	95
7072145	93	80	102
7072146	98	85	99
7072148	105	96	102
7072149	85	76	100
7072150	78	73	97
7072151	97	86	101
7072152	99	89	101
7072152	98	92	116
DL			
7072153	95	82	98
7072153	89	85	121
DL			
7072154	94	84	95
7072154	90	87	117
DL			
7072155	88	81	102
7072156	86	88	97
7072157	80	77	100

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 06/18/13 at 12:47 PM

Group Number: 1392839

Surrogate Quality Control

7072158	89	91	97
7072159	72	72	81
7072164	90	79	98
7072164	91	87	100
DL			
Blank	92	94	102
LCS	93	96	103
MS	93	80	102
MSD	98	85	99

Limits: 54-129 61-134 55-129

Analysis Name: SIM SVOA (microwave)

Batch number: 13150SLF026

Fluoranthene-d10 Benzo(a)pyrene-d12 1-Methylnaphthalene-d10

7072165	84	85	101
Blank	92	94	101
LCS	93	94	102
MS	98	105	113
MSD	98	101	120

Limits: 54-129 61-134 55-129

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Services Analysis Request/Chain of Custody



Lancaster
Laboratories

Acct. # 11372 Group # 1392839 Sample # 7072138-65

Client: PTP LLC				Matrix				Analyses Requested				For Lab Use Only				
												Preservation Codes				SF #: _____
Project Name/#: SWMU 5 Benthic Study		Site ID #:		<input checked="" type="checkbox"/> Sediment	<input type="checkbox"/> Soil	<input type="checkbox"/> Potable	<input type="checkbox"/> Water	<input type="checkbox"/> NPDES	<input type="checkbox"/> Surface	<input type="checkbox"/> Other:	Total # of Containers	Moisture, PAH, TOC	Grain size	SCR #: _____		
Project Manager: David Lane - CH2M HILL		P.O. #:												<input type="checkbox"/> Ground	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:
Sampler: Rick Gorsira		PWSID #:		Preservation Codes H = HCl T = Thiosulfate N = HNO ₃ B = NaOH S = H ₂ SO ₄ P = H ₃ PO ₄ O = Other												
Phone #: 352-222-4923		Quote #:														
State where sample(s) were collected:																
Sample Identification				Collection				<input type="checkbox"/> Grab	<input type="checkbox"/> Composite	<input type="checkbox"/> Total # of Containers	Moisture, PAH, TOC	Grain size	Remarks			
				Date	Time	<input type="checkbox"/> Potable	<input type="checkbox"/> Water						<input type="checkbox"/> NPDES	<input type="checkbox"/> Surface	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:
05-T04-SD2	5/22/13	0930	x	x						2	1	1				
05-T06-SD2	5/22/13	0955	x	x						2	1	1				
05-T08-SD2		1015	x	x						2	1	1				
05-T10-SD1		1055	x	x						2	1	1				
05-T10-SD3		1115	x	x						2	1	1				
05-T12-SD1		1300	x	x						2	1	1				
05-T12-SD3		1315	x	x						2	1	1				
05-T14-SD1		1350	x	x						2	1	1				
05-T14-SD3		1415	x	x						2	1	1				
05-T16-SD1	▼	1435	x	x						2	1	1				
Turnaround Time Requested (TAT) (please check): Standard <input checked="" type="checkbox"/> Rush <input type="checkbox"/>								Relinquished by:		Date	Time	Received by:	Date	Time		
(Rush TAT is subject to Lancaster Laboratories approval and surcharges.)								<i>Rick Gorsira</i>		5/23/13	0930					
Date results are needed: 30 days								Relinquished by:		Date	Time	Received by:	Date	Time		
Rush results requested by (please check): E-Mail <input type="checkbox"/> Phone <input type="checkbox"/>								<i>Rick Gorsira</i>		5/23/13	1200					
E-mail Address:								Relinquished by:		Date	Time	Received by:	Date	Time		
Phone:								Relinquished by:		Date	Time	Received by:	Date	Time		
Data Package Options (please check if required)								Relinquished by:		Date	Time	Received by:	Date	Time		
Type I (Validation/non-CLP)	<input type="checkbox"/>	MA MCP	<input type="checkbox"/>	Relinquished by:		Date	Time	Received by:	Date	Time						
Type III (Reduced non-CLP)	<input type="checkbox"/>	CT RCP	<input type="checkbox"/>	Relinquished by:		Date	Time	Received by:	Date	Time						
Type IV (CLP SOW)	<input type="checkbox"/>	TX TRRP-13	<input type="checkbox"/>	Relinquished by:		Date	Time	Received by:	<i>B. Mungo</i>	5/25/13 915						
Type VI (Raw Data Only)	<input type="checkbox"/>	Relinquished by Commercial Carrier:						Temperature upon receipt <i>S. J.</i> °C								
EDD Required?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	If yes, format: _____				UPS	FedEx <input checked="" type="checkbox"/>								

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7045.01

Environmental Services Analysis Request/Chain of Custody



Lancaster
Laboratories

Acct. # 11372 Group # 1392839 Sample # 7072138-45

Client: PTP LLC			Matrix			Analyses Requested						For Lab Use Only						
						Preservation Codes						SF #:						
												SCR #:						
												Preservation Codes						
												H = HCl	T = Thiosulfate					
												N = HNO ₃	B = NaOH					
												S = H ₂ SO ₄	P = H ₃ PO ₄					
												O = Other						
												Remarks						
Sample Identification			Collection			Grab	Composite	Soil	Water	NPDES	Other:	Total # of Containers	Moisture, PAH, TOC	Grain size				
			Date	Time														
05-T16-SD3		5/22/13	1455	x			x				2	1	1					
05-T18-SD1			1510	x			x				2	1	1					
05-T18-SD3			1530	x			x				2	1	1					
05-T20-SD1			1550	x			x				2	1	1					
05-T20-SD3		5/23/13	0820	x			x				2	1	1					
BKG-1			0935	x			x				2	1	1					
BKG-2			0855	x			x				2	1	1					
BKG-3		5/23/13	1130	x			x				2	1	1					
BKG-4		5/23/13	12:15	x			x				2	1	1					
Turnaround Time Requested (TAT) (please check): Standard <input checked="" type="checkbox"/> Rush <input type="checkbox"/>								Relinquished by:		Date	Time	Received by:	Date	Time				
(Rush TAT is subject to Lancaster Laboratories approval and surcharges.)																		
Date results are needed: 30 days								Relinquished by:		Date	Time	Received by:	Date	Time				
Rush results requested by (please check): E-Mail <input type="checkbox"/> Phone <input type="checkbox"/>								Relinquished by:		Date	Time	Received by:	Date	Time				
E-mail Address:								Relinquished by:		Date	Time	Received by:	Date	Time				
Phone:								Relinquished by:		Date	Time	Received by:	Date	Time				
Data Package Options (please check if required)								Relinquished by:		Date	Time	Received by:	Date	Time				
Type I (Validation/non-CLP)	<input type="checkbox"/>	MA MCP	<input type="checkbox"/>	Relinquished by:		Date	Time	Received by:	Date	Time								
Type III (Reduced non-CLP)	<input type="checkbox"/>	CT RCP	<input type="checkbox"/>	Relinquished by:		Date	Time	Received by:	Date	Time								
Type IV (CLP SOW)	<input type="checkbox"/>	TX TRRP-13	<input type="checkbox"/>	Relinquished by:		Date	Time	Received by:	Date	Time								
Type VI (Raw Data Only)	<input type="checkbox"/>	Relinquished by Commercial Carrier:						UPS FedEx X		Temperature upon receipt <u>S.1</u> °C								
EDD Required?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	If yes, format:															

Environmental Services Analysis Request/Chain of Custody



Lancaster
Laboratories

Acct. # 11372 Group # 13912839 Sample # 7072138-65

Client: PTP LLC				Matrix				Analyses Requested				For Lab Use Only	
Project Name/#: SWMU 5 Benthic Study		Site ID #:		<input checked="" type="checkbox"/> Sediment	<input type="checkbox"/>	<input type="checkbox"/> Potable	<input type="checkbox"/> Ground	<input type="checkbox"/>	<input type="checkbox"/> NPDES	<input type="checkbox"/> Surface	<input type="checkbox"/>		SF #:
Project Manager: David Lane - CH2M HILL		P.O. #:			<input type="checkbox"/> Soil	<input type="checkbox"/> Water	<input type="checkbox"/> Other:						
Sampler: Rick Gorsira		PWSID #:		<input type="checkbox"/>									
Phone #: 352-222-4923		Quote #:		<input type="checkbox"/>									
State where sample(s) were collected:								<input type="checkbox"/>					
Sample Identification		Collection			<input type="checkbox"/> Grab	<input type="checkbox"/> Composite	Total # of Containers	Moisture, PAH, TOC	Grain size	PAH	TOC	Preservation Codes	
		Date	Time									H = HCl	T = Thiosulfate
EB-1	5/21/13	09:20	x		x		2			1	1	N = HNO ₃	B = NaOH
EB-2	5/23/13	09:20	x		x		2			1	1	S = H ₂ SO ₄	P = H ₃ PO ₄
FB-1	5/21/13	09:15	x		x		2			1	1	O = Other	
FB-2	5/23/13	09:15	x		x		2			1	1		
FD-1	5/22/13	13:00	x		x		2	1	1				
FD-2	5/22/13	14:15	x		x		2	1	1				
MS	5/22/13	13:15	x		x		2	1	1				
MSD	5/22/13	13:15	x		x		2	1	1				
Turnaround Time Requested (TAT) (please check): Standard <input checked="" type="checkbox"/> Rush <input type="checkbox"/> (Rush TAT is subject to Lancaster Laboratories approval and surcharges.)							Relinquished by:	Date	Time	Received by:	Date	Time	
Date results are needed: 30 days							Relinquished by:	Date	Time	Received by:	Date	Time	
Rush results requested by (please check): E-Mail <input type="checkbox"/> Phone <input type="checkbox"/>							Relinquished by:	Date	Time	Received by:	Date	Time	
E-mail Address:							Relinquished by:	Date	Time	Received by:	Date	Time	
Phone:							Relinquished by:	Date	Time	Received by:	Date	Time	
Data Package Options (please check if required)							Relinquished by:	Date	Time	Received by:	Date	Time	
Type I (Validation/non-CLP)		<input type="checkbox"/>	MA MCP	<input type="checkbox"/>			Relinquished by:	Date	Time	Received by:	Date	Time	
Type III (Reduced non-CLP)		<input type="checkbox"/>	CT RCP	<input type="checkbox"/>			Relinquished by:	Date	Time	Received by:	Date	Time	
Type IV (CLP SOW)		<input type="checkbox"/>	TX TRRP-13	<input type="checkbox"/>			Relinquished by Commercial Carrier:						
Type VI (Raw Data Only)		<input type="checkbox"/>					UPS	FedEx	X	Temperature upon receipt	S.1	°C	
EDD Required?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	If yes, format:									

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m³	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter
<	less than - The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
>	greater than		
J	estimated value – The result is \geq the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers

- A** TIC is a possible aldol-condensation product
- B** Analyte was also detected in the blank
- C** Pesticide result confirmed by GC/MS
- D** Compound quantitated on a diluted sample
- E** Concentration exceeds the calibration range of the instrument
- N** Presumptive evidence of a compound (TICs only)
- P** Concentration difference between primary and confirmation columns $>25\%$
- U** Compound was not detected
- X,Y,Z** Defined in case narrative

Inorganic Qualifiers

- B** Value is <CRDL, but \geq IDL
- E** Estimated due to interference
- M** Duplicate injection precision not met
- N** Spike sample not within control limits
- S** Method of standard additions (MSA) used for calculation
- U** Compound was not detected
- W** Post digestion spike out of control limits
- * Duplicate analysis not within control limits
- + Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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Appendix B
Data Validation Report

Data Validation Summary

PTPLLC, SWMU 5

TO: David Lane/CH2M HILL/GNV

FROM: Tiffany McGlynn/CH2M HILL/GNV
Ward Dickens/CH2M HILL/GNV

DATE: August 1, 2013

The purpose of this memorandum is to present the results of the data validation process for the samples collected at the PTPLLC, SWMU 5 site in Penuelas, Puerto Rico . The samples were collected in May 2013.

The Quality Control areas that were reviewed and the resulting findings are documented within each subsection that follows. These data were validated for compliance with the cited analytical method requirements. This process also included a review of the data to assess the accuracy, precision, and completeness based upon procedures described in the guidance documents including the Environmental Protection Agency (EPA) National Functional Guidelines for Organic Data Review (EPA 1999) and the EPA National Functional Guidelines for Evaluating Inorganic Analysis (EPA 2002). The Quality assurance/Quality control (QA/QC) summary forms and data reports provided by the laboratory were reviewed.

Samples were submitted to Lancaster Laboratories, Inc. for the analyses listed below:

- SW8270C_SIM Semivolatiles
- Lloyd Kahn Total Organic Carbon

During the data review and validation process, sample results that were not within the acceptance limits were appended with a primary qualifying flag to indicate a problem with the data and a secondary sub-qualifier flag (validation reason code) to provide the reasoning behind the assignment of a qualifier to the data.

The following primary flags were used to qualify the data:

- [=] Detected. The analyte was detected at the concentration shown.
- [J] Estimated. The analyte was present but the reported value may not be accurate or precise.
- [U] Not detected. The analyte was not detected above the method detection limit.
- [UJ] Not detected, estimated. The analyte was qualified as not detected and the detection limit is estimated.
- [R] Rejected. The data is not useable.

- [X] Excluded. Data not used due to dilution or reanalysis, and another value is more appropriate.

Table 2 lists the validation reason codes that were used to qualify the data.

Table 2	
Validation Reason Codes	
<i>PTPLLC, SWMU 5</i>	
Validation Reason Code	Definition
TEMP	Samples received outside temperature requirements
FD	Field duplicate precision criteria not met
MSL	Matrix spike recovery below criteria
MSDL	Matrix spike duplicate recovery below criteria

Attachment 1 lists the results that were qualified during the data validation process except those that were excluded due to dilution or reanalysis.

Quality Control Review

The following list represents the QA/QC measures that were reviewed during the data quality evaluation process.

Holding Times

Each sample must be analyzed within a method specified holding time. The holding times for each parameter were evaluated according to SW-846 requirements and met criteria. Although all samples were received and analyzed within holding time, one cooler was received at the lab with a temperature of >10°C. Samples affected by the temperature exceedance are qualified in **Attachment 1**.

Blank Samples

For the organic analyses, method blanks (MB), equipment blanks (EB), ambient blanks (AB), and trip blanks (TB) were provided. For the inorganic analysis, MB, EB, AB, and initial and continuing calibration blanks (ICB/CCB) were provided. Blank samples enable the reviewer to determine if an analyte may be attributed to sampling or laboratory procedures, rather than contamination from site or laboratory activities. Blank samples were analyzed for each parameter at the required frequency and were evaluated according to SW-846 requirements.

Several compounds were detected in the equipment blanks and field blanks. Sample concentrations were either non-detect or above the blank value. No data were qualified.

Surrogate Recoveries

Surrogate spikes consist of organic compounds which are similar in chemical composition and behavior to the method target compounds, but which are not normally

found in environmental samples. Surrogate compounds are added to each sample and the recoveries are used to monitor lab performance and possible matrix interference. The surrogate recoveries for each parameter were evaluated according to SW-846 requirements. All acceptance criteria were met.

Lab Control Sample/Lab Control Sample Duplicate (LCS/LCSD)

These samples are quality control samples, spiked with a known concentration of target analytes, utilized to monitor laboratory method performance. The accuracy and precision of the LCS/LCSD indicate whether the analytical method was in control. Additionally, these measurements serve as a monitor of the overall performance of each step during the analysis, including sample preparation. The samples do not possess a difficult matrix as they consist of deionized laboratory water spiked with target compounds of interest. The LCS/LCSD recoveries for each parameter were evaluated according to SW-846 requirements. All acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

This is an aliquot of sample spiked with a known concentration of target analytes. Spike recoveries are used to evaluate potential matrix interferences, as well as accuracy and precision pertaining to each specific matrix. The MS/MSD recoveries for each parameter were evaluated according to SW-846 requirements.

For spiked sample 05-T12-SD3, several compounds in method SW8270C_SIM exhibited low recoveries in the MS/MSD.

Qualified data are summarized in **Attachment 1**.

Internal Standards

These are compounds added to the sample extracts prior to analysis, and their retention time and response evaluated for method compliance. The internal standards are used in quantitation of the target parameters and monitor the instrument sensitivity and response for stability during each analysis. The internal standard recoveries for each parameter were evaluated according to SW-846 requirements. All acceptance criteria were met.

Field Duplicate Samples

These samples measure field and laboratory precision as well as sample homogeneity. This information can only be determined when target compounds are detected. The field duplicate precision for each parameter was evaluated according to SW-846 requirements.

Several compounds in method SW8270C_SIM did not meet field duplicate precision criteria for native sample 05-T12-SD1 and field duplicate FD-1_130522.

Qualified data are summarized in **Attachment 1**.

Serial Dilutions

The serial dilution of samples quantitated by ICP determines whether or not significant physical or chemical interferences exist due to sample matrix. If the analyte concentration is greater than 50 times the MDL, the serial dilution analysis must agree

within a 10% difference of the original determination after correction for dilution. All serial dilution criteria were met.

Initial Calibration

The initial calibration ensures that the instrument is capable of producing acceptable qualitative and quantitative data for the compounds of interest. Multiple standard solutions are analyzed to determine the response and linearity of the instrument over a varying concentration range. The initial calibration data were evaluated according to SW-846 requirements. All calibration criteria were.

Continuing Calibration

The continuing calibration checks satisfactory performance of the instrument and its predicted response to the target compounds by analysis of a standard solution(s) at known concentrations. The continuing calibration data was evaluated according to SW-846 requirements. All continuing calibration criteria were met.

Results Near the Method Detection Limit

The method detection limit (MDL) is defined as the minimum concentration of an analyte that can be identified, measured, and reported with 99% confidence that the analyte concentration is greater than zero. Sample results at or near the MDL are not accurate or precise. This situation is often caused by instrument noise, or low-level background shifts, rather than a true analyte signal. As concentrations approach a "quantitation limit," the confidence in the values increases. If the reported result was above the MDL, but below the RL, the data was qualified as estimated.

PARCCs

Precision--is defined as the agreement between duplicate results, and was estimated by comparing duplicate matrix spike recoveries, and field duplicate sample results. The precision between the native and field duplicate sample results for the majority of analyses were within acceptable criteria indicating that the sample matrix did not significantly interfere with the overall analytical process.

Accuracy--is a measure of the agreement between an experimental determination and the true value of the parameter. The samples were spiked with a surrogate compound with a known concentration before preparation. The surrogate and MS/MSD data provides a measure of the matrix effects as they may affect accuracy and precision on the analytical method. The LCS results demonstrate accuracy of the method. Spike recoveries were within the method acceptance limits, except where noted, which indicated no evidence of matrix interferences that would affect the usability of the data.

Representativeness--These criteria is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition. Representativeness is a subjective parameter and is used to evaluate the efficacy of the sampling plan design. Representativeness was demonstrated by providing full descriptions in the project scoping documents of the sampling techniques and the rationale used for selecting sampling locations.

Completeness--is defined as the percentage of measurements that are judged to be valid compared to the total number of measurements made. There was no data rejected or seen as not usable due to quality control or sampling technique issues.

Comparability-- Factors that affect comparability are sample collection and handling techniques, sample matrix type, and analytical method. Comparability is limited by the other PARCC parameters because data sets can be compared with confidence only when precision and accuracy are known. Data from this investigation are comparable with other previous data collected at the site due to the laboratory use of EPA methods to analyze the samples and supported by the results of the laboratory's analytical reports.

Conclusion

A review of the analytical data submitted for the PTPLLC SWMU 5 site in Penuelas, Puerto Rico has been completed. An overall evaluation of the data indicates that the sample handling, shipment, and analytical procedures have been adequately completed. The validation review demonstrated that the analytical systems were generally in control and the data results can be used in the project decision making process.

Attachment 1													
Qualified Data													
PTPLLC SWMU 5, May 2013 Sampling													
Parameter Class	SDG	Sample ID	Sample Type	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Detection Limit	Reporting Limit	Units	Validation Notes
GENCHEM	RFI21	05-T08-SD2	N	LYDKHN	Total organic carbon	37300	=	37300	J	1690	5070	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Phenanthrene	4500	=	4500	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Anthracene	5300	=	5300	J	8.2	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Benzo(a)anthracene	7200	=	7200	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Benzo(a)pyrene	6200	=	6200	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Naphthalene	190	=	190	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Benzo(b)fluoranthene	6000	=	6000	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Benzo(g,h,i)perylene	1300	=	1300	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Indeno(1,2,3-c,d)pyrene	1300	=	1300	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Benzo(k)fluoranthene	1600	=	1600	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Chrysene	7300	=	7300	J	8.2	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Dibenz(a,h)anthracene	690	=	690	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Fluorene	2100	=	2100	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	1-methylnaphthalene	490	=	490	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	2-Methylnaphthalene	280	=	280	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2	N	BNASIM	Acenaphthene	1900	=	1900	J	16	41	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2DL	LR	BNASIM	Pyrene	23000	=	23000	J	160	410	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2DL	LR	BNASIM	Acenaphthylene	17000	=	17000	J	82	410	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T08-SD2DL	LR	BNASIM	Fluoranthene	10000	=	10000	J	160	410	ug/Kg	TEMP
GENCHEM	RFI21	05-T10-SD1	N	LYDKHN	Total organic carbon	29100	=	29100	J	2990	8970	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Naphthalene	120	=	120	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Benzo(a)anthracene	8400	=	8400	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Phenanthrene	4900	=	4900	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Benzo(g,h,i)perylene	1400	=	1400	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Acenaphthene	2200	=	2200	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Benzo(b)fluoranthene	6500	=	6500	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Benzo(a)pyrene	6600	=	6600	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	2-Methylnaphthalene	190	=	190	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Benzo(k)fluoranthene	2000	=	2000	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Dibenz(a,h)anthracene	790	=	790	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Fluorene	2500	=	2500	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Indeno(1,2,3-c,d)pyrene	1500	=	1500	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	1-methylnaphthalene	200	=	200	J	17	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1	N	BNASIM	Anthracene	5600	=	5600	J	8.5	43	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1DL	LR	BNASIM	Pyrene	32000	=	32000	J	170	430	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1DL	LR	BNASIM	Chrysene	11000	=	11000	J	85	430	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1DL	LR	BNASIM	Acenaphthylene	18000	=	18000	J	85	430	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD1DL	LR	BNASIM	Fluoranthene	14000	=	14000	J	170	430	ug/Kg	TEMP
GENCHEM	RFI21	05-T10-SD3	N	LYDKHN	Total organic carbon	25300	=	25300	J	2450	7350	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3	N	BNASIM	Indeno(1,2,3-c,d)pyrene	220	=	220	J	1.8	4.5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3	N	BNASIM	1-methylnaphthalene	68	=	68	J	1.8	4.5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3	N	BNASIM	Phenanthrene	650	=	650	J	1.8	4.5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3	N	BNASIM	Naphthalene	46	=	46	J	1.8	4.5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3	N	BNASIM	Acenaphthene	350	=	350	J	1.8	4.5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3	N	BNASIM	2-Methylnaphthalene	52	=	52	J	1.8	4.5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3	N	BNASIM	Benzo(g,h,i)perylene	200	=	200	J	1.8	4.5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3	N	BNASIM	Benzo(k)fluoranthene	400	=	400	J	1.8	4.5	ug/Kg	TEMP

Attachment 1

Qualified Data

PTPLLC SWMU 5, May 2013 Sampling

Parameter Class	SDG	Sample ID	Sample Type	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Detection Limit	Reporting Limit	Units	Validation Notes
SVOC_SIM	RFI21	05-T10-SD3	N	BNASIM	Dibenz(a,h)anthracene	140	=	140	J	1.8	4.5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3	N	BNASIM	Fluorene	580	=	580	J	1.8	4.5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3DL	LR	BNASIM	Acenaphthylene	3600	=	3600	J	9	45	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3DL	LR	BNASIM	Pyrene	4800	=	4800	J	18	45	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3DL	LR	BNASIM	Benzo(b)fluoranthene	1400	=	1400	J	18	45	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3DL	LR	BNASIM	Anthracene	1100	=	1100	J	9	45	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3DL	LR	BNASIM	Benzo(a)anthracene	1700	=	1700	J	18	45	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3DL	LR	BNASIM	Benzo(a)pyrene	1500	=	1500	J	18	45	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3DL	LR	BNASIM	Chrysene	1800	=	1800	J	9	45	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T10-SD3DL	LR	BNASIM	Fluoranthene	2200	=	2200	J	18	45	ug/Kg	TEMP
GENCHEM	RFI21	05-T12-SD1	N	LYDKHN	Total organic carbon	17300	=	17300	J	3050	9150	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Pyrene	4700	=	4700	J	18	46	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Phenanthrene	4900	=	4900	J	18	46	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	1-methylnaphthalene	260	=	260	J	18	46	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	2-Methylnaphthalene	200	=	200	J	18	46	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Indeno(1,2,3-c,d)pyrene	280	=	280	J	18	46	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Acenaphthylene	3000	=	3000	J	9.1	46	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Benzo(a)anthracene	1500	=	1500	J	18	46	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Benzo(a)pyrene	1000	=	1000	J	18	46	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Anthracene	1700	=	1700	J	9.1	46	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Fluoranthene	3000	=	3000	J	18	46	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Naphthalene	92	=	92	J	18	46	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Benzo(b)fluoranthene	1500	=	1500	J	18	46	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Benzo(g,h,i)perylene	240	=	240	J	18	46	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Benzo(k)fluoranthene	330	=	330	J	18	46	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Chrysene	2200	=	2200	J	9.1	46	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Dibenz(a,h)anthracene	120	=	120	J	18	46	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Fluorene	1100	=	1100	J	18	46	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD1	N	BNASIM	Acenaphthene	330	=	330	J	18	46	ug/Kg	FD,TEMP
GENCHEM	RFI21	05-T12-SD3	N	LYDKHN	Total organic carbon	17300	=	17300	J	3120	9350	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Fluorene	160	=	160	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Pyrene	820	=	820	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Phenanthrene	520	=	520	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Naphthalene	200	=	200	J	2	4.9	ug/Kg	MSDL,MSL,TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	2-Methylnaphthalene	110	=	110	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	1-methylnaphthalene	110	=	110	J	2	4.9	ug/Kg	MSDL,MSL,TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Benzo(a)anthracene	280	=	280	J	2	4.9	ug/Kg	MSDL,TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Acenaphthene	100	=	100	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Indeno(1,2,3-c,d)pyrene	87	=	87	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Anthracene	340	=	340	J	0.99	4.9	ug/Kg	MSDL,MSL,TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Fluoranthene	430	=	430	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Benzo(a)pyrene	280	=	280	J	2	4.9	ug/Kg	MSDL,TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Benzo(b)fluoranthene	320	=	320	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Benzo(g,h,i)perylene	100	=	100	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Benzo(k)fluoranthene	91	=	91	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Chrysene	390	=	390	J	0.99	4.9	ug/Kg	MSDL,TEMP
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Dibenz(a,h)anthracene	42	=	42	J	2	4.9	ug/Kg	TEMP

Attachment 1													
Qualified Data													
PTPLLC SWMU 5, May 2013 Sampling													
Parameter Class	SDG	Sample ID	Sample Type	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Detection Limit	Reporting Limit	Units	Validation Notes
SVOC_SIM	RFI21	05-T12-SD3	N	BNASIM	Acenaphthylene	760	=	760	J	0.99	4.9	ug/Kg	TEMP
GENCHEM	RFI21	05-T14-SD1	N	LYDKHN	Total organic carbon	15900	=	15900	J	1340	4010	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Fluoranthene	3600	=	3600	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Pyrene	6200	=	6200	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Phenanthrene	3100	=	3100	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Naphthalene	79	=	79	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	2-Methylnaphthalene	110	=	110	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	1-methylnaphthalene	150	=	150	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Indeno(1,2,3-c,d)pyrene	350	=	350	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Acenaphthene	290	=	290	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Dibenz(a,h)anthracene	180	=	180	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Chrysene	2300	=	2300	J	6.7	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Benz(k)fluoranthene	430	=	430	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Benz(g,h,i)perylene	350	=	350	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Benz(b)fluoranthene	1600	=	1600	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Benzo(a)pyrene	1400	=	1400	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Benzo(a)anthracene	2100	=	2100	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Acenaphthylene	3500	=	3500	J	6.7	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Fluorene	780	=	780	J	13	33	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD1	N	BNASIM	Anthracene	1300	=	1300	J	6.7	33	ug/Kg	TEMP
GENCHEM	RFI21	05-T14-SD3	N	LYDKHN	Total organic carbon	21500	=	21500	J	2830	8490	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Benzo(k)fluoranthene	80	=	80	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Benzo(g,h,i)perylene	57	=	57	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	2-Methylnaphthalene	71	=	71	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Benzo(b)fluoranthene	270	=	270	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Chrysene	280	=	280	J	0.99	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Benzo(a)pyrene	230	=	230	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Benzo(a)anthracene	220	=	220	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Anthracene	320	=	320	J	0.99	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Acenaphthene	80	=	80	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Acenaphthylene	780	=	780	J	0.99	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Indeno(1,2,3-c,d)pyrene	54	=	54	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Dibenz(a,h)anthracene	27	=	27	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Pyrene	670	=	670	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Phenanthrene	370	=	370	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Naphthalene	110	=	110	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	1-methylnaphthalene	65	=	65	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Fluoranthene	330	=	330	J	2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T14-SD3	N	BNASIM	Fluorene	140	=	140	J	2	5	ug/Kg	TEMP
GENCHEM	RFI21	05-T16-SD1	N	LYDKHN	Total organic carbon	29500	=	29500	J	2240	6710	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Dibenz(a,h)anthracene	23	=	23	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Fluorene	100	=	100	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Phenanthrene	190	=	190	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Naphthalene	31	=	31	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	2-Methylnaphthalene	27	=	27	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	1-methylnaphthalene	25	=	25	J	2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Indeno(1,2,3-c,d)pyrene	52	=	52	J	2	4.9	ug/Kg	TEMP

Attachment 1													
Qualified Data													
PTPLLC SWMU 5, May 2013 Sampling													
Parameter Class	SDG	Sample ID	Sample Type	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Detection Limit	Reporting Limit	Units	Validation Notes
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Pyrene	460	=	460 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Anthracene	270	=	270 J	0.99	4.9	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Fluoranthene	210	=	210 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Acenaphthylene	770	=	770 J	0.99	4.9	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Benzo(a)anthracene	170	=	170 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Benzo(a)pyrene	190	=	190 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Benzo(b)fluoranthene	210	=	210 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Benzo(g,h,i)perylene	65	=	65 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Benzo(k)fluoranthene	60	=	60 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Chrysene	220	=	220 J	0.99	4.9	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T16-SD1	N	BNASIM	Acenaphthene	44	=	44 J		2	4.9	ug/Kg	TEMP
GENCHEM	RFI21	05-T16-SD3	N	LYDKHN	Total organic carbon	30900	=	30900 J		2930	8790	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Anthracene	230	=	230 J	0.99	5	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Fluorene	85	=	85 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Pyrene	290	=	290 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Phenanthrene	160	=	160 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Naphthalene	36	=	36 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	2-Methylnaphthalene	29	=	29 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	1-methylnaphthalene	25	=	25 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Indeno(1,2,3-c,d)pyrene	40	=	40 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Fluoranthene	140	=	140 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Chrysene	130	=	130 J	0.99	5	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Benzo(k)fluoranthene	47	=	47 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Benzo(g,h,i)perylene	51	=	51 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Benzo(b)fluoranthene	160	=	160 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Acenaphthene	37	=	37 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Benzo(a)anthracene	110	=	110 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Acenaphthylene	670	=	670 J	0.99	5	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Dibenz(a,h)anthracene	17	=	17 J		2	5	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T16-SD3	N	BNASIM	Benzo(a)pyrene	140	=	140 J		2	5	ug/Kg	TEMP
GENCHEM	RFI21	05-T20-SD1	N	LYDKHN	Total organic carbon	16100	=	16100 J		3500	10500	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Fluorene	260	=	260 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Phenanthrene	210	=	210 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Naphthalene	21	=	21 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	2-Methylnaphthalene	33	=	33 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	1-methylnaphthalene	29	=	29 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Indeno(1,2,3-c,d)pyrene	91	=	91 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Fluoranthene	510	=	510 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Acenaphthene	130	=	130 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Chrysene	550	=	550 J	0.84	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Benzo(k)fluoranthene	190	=	190 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Benzo(g,h,i)perylene	86	=	86 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Benzo(b)fluoranthene	580	=	580 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Benzo(a)pyrene	580	=	580 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Anthracene	580	=	580 J	0.84	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Dibenz(a,h)anthracene	51	=	51 J	1.7	4.2	ug/Kg	TEMP	
SVOC_SIM	RFI21	05-T20-SD1	N	BNASIM	Benzo(a)anthracene	710	=	710 J		1.7	4.2	ug/Kg	TEMP

Attachment 1													
Qualified Data													
PTPLLC SWMU 5, May 2013 Sampling													
Parameter Class	SDG	Sample ID	Sample Type	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Detection Limit	Reporting Limit	Units	Validation Notes
SVOC_SIM	RFI21	05-T20-SD1DL	LR	BNASIM	Pyrene	2000	=	2000 J		17	42	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD1DL	LR	BNASIM	Acenaphthylene	1700	=	1700 J		8.4	42	ug/Kg	TEMP
GENCHEM	RFI21	05-T20-SD3	N	LYDKHN	Total organic carbon	19200	=	19200 J		3710	11100	mg/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Benzo(k)fluoranthene	69	=	69 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Fluorene	110	=	110 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Pyrene	420	=	420 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Phenanthrene	100	=	100 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Naphthalene	27	=	27 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	2-Methylnaphthalene	32	=	32 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	1-methylnaphthalene	30	=	30 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Indeno(1,2,3-c,d)pyrene	35	=	35 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Fluoranthene	180	=	180 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Chrysene	220	=	220 J		0.72	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Benzo(g,h,i)perylene	34	=	34 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Benzo(b)fluoranthene	210	=	210 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Benzo(a)pyrene	200	=	200 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Benzo(a)anthracene	190	=	190 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Anthracene	210	=	210 J		0.72	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Acenaphthylene	680	=	680 J		0.72	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Acenaphthene	51	=	51 J		1.4	3.6	ug/Kg	TEMP
SVOC_SIM	RFI21	05-T20-SD3	N	BNASIM	Dibenz(a,h)anthracene	19	=	19 J		1.4	3.6	ug/Kg	TEMP
GENCHEM	RFI21	BKG-1_130523	N	LYDKHN	Total organic carbon	31500	=	31500 J		3910	11700	mg/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Dibenz(a,h)anthracene	2.1	U	2.1 UJ		2.1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Benzo(a)anthracene	9.7	=	9.7 J		2.1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Pyrene	34	=	34 J		2.1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Phenanthrene	10	=	10 J		2.1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Fluoranthene	12	=	12 J		2.1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Fluorene	9.7	=	9.7 J		2.1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Acenaphthene	5.7	=	5.7 J		2.1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Benzo(a)pyrene	12	=	12 J		2.1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Acenaphthylene	56	=	56 J		1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Anthracene	17	=	17 J		1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Benzo(b)fluoranthene	17	=	17 J		2.1	5.2	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-1_130523	N	BNASIM	Chrysene	12	=	12 J		1	5.2	ug/Kg	TEMP
GENCHEM	RFI21	BKG-2_130523	N	LYDKHN	Total organic carbon	36900	=	36900 J		2750	8240	mg/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Dibenz(a,h)anthracene	2.1	U	2.1 UJ		2.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Pyrene	30	=	30 J		2.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Phenanthrene	8	=	8 J		2.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Fluorene	5.5	=	5.5 J		2.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Chrysene	10	=	10 J		1.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Benzo(b)fluoranthene	13	=	13 J		2.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Benzo(a)pyrene	10	=	10 J		2.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Benzo(a)anthracene	8.9	=	8.9 J		2.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Anthracene	7.5	=	7.5 J		1.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Acenaphthylene	22	=	22 J		1.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Acenaphthene	2.1	U	2.1 UJ		2.1	5.3	ug/Kg	TEMP
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Benzo(g,h,i)perylene	5.4	=	5.4 J		2.1	5.3	ug/Kg	TEMP

Attachment 1

Qualified Data

PTPLLC SWMU 5, May 2013 Sampling

Parameter Class	SDG	Sample ID	Sample Type	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Detection Limit	Reporting Limit	Units	Validation Notes
SVOC_SIM	RFI21	BKG-2_130523	N	BNASIM	Fluoranthene	11 =		11 J		2.1	5.3	ug/Kg	TEMP
GENCHEM	RFI21	FD-1_130522	FD	LYDKHN	Total organic carbon	37500 =		37500 J		3500	10500	mg/Kg	TEMP
SVOC_SIM	RFI21	FD-1_130522	FD	BNASIM	Acenaphthene	320 =		320 J		2	5.1	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	FD-1_130522	FD	BNASIM	Indeno(1,2,3-c,d)pyrene	340 =		340 J		2	5.1	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	FD-1_130522	FD	BNASIM	1-methylnaphthalene	310 =		310 J		2	5.1	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	FD-1_130522	FD	BNASIM	2-Methylnaphthalene	250 =		250 J		2	5.1	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	FD-1_130522	FD	BNASIM	Naphthalene	300 =		300 J		2	5.1	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	FD-1_130522	FD	BNASIM	Benzo(k)fluoranthene	420 =		420 J		2	5.1	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	FD-1_130522	FD	BNASIM	Benzo(g,h,i)perylene	300 =		300 J		2	5.1	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	FD-1_130522	FD	BNASIM	Dibenz(a,h)anthracene	150 =		150 J		2	5.1	ug/Kg	FD,TEMP
SVOC_SIM	RFI21	FD-1_130522DL	LR	BNASIM	Fluorene	1200 =		1200 J		20	51	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-1_130522DL	LR	BNASIM	Fluoranthene	3500 =		3500 J		20	51	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-1_130522DL	LR	BNASIM	Pyrene	5900 =		5900 J		20	51	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-1_130522DL	LR	BNASIM	Phenanthrene	5500 =		5500 J		20	51	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-1_130522DL	LR	BNASIM	Benzo(b)fluoranthene	1800 =		1800 J		20	51	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-1_130522DL	LR	BNASIM	Benzo(a)pyrene	1400 =		1400 J		20	51	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-1_130522DL	LR	BNASIM	Benzo(a)anthracene	1800 =		1800 J		20	51	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-1_130522DL	LR	BNASIM	Anthracene	1700 =		1700 J		10	51	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-1_130522DL	LR	BNASIM	Acenaphthylene	3300 =		3300 J		10	51	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-1_130522DL	LR	BNASIM	Chrysene	2700 =		2700 J		10	51	ug/Kg	TEMP
GENCHEM	RFI21	FD-2_130522	FD	LYDKHN	Total organic carbon	22800 =		22800 J		4550	13600	mg/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Fluoranthene	320 =		320 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Indeno(1,2,3-c,d)pyrene	48 =		48 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	1-methylnaphthalene	78 =		78 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	2-Methylnaphthalene	90 =		90 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Naphthalene	120 =		120 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Fluorene	160 =		160 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Pyrene	660 =		660 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Benzo(a)pyrene	230 =		230 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Phenanthrene	370 =		370 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Dibenz(a,h)anthracene	23 =		23 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Chrysene	280 =		280 J		0.99	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Benzo(k)fluoranthene	80 =		80 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Benzo(b)fluoranthene	300 =		300 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Benzo(a)anthracene	230 =		230 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Anthracene	370 =		370 J		0.99	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Acenaphthylene	780 =		780 J		0.99	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Acenaphthene	85 =		85 J		2	4.9	ug/Kg	TEMP
SVOC_SIM	RFI21	FD-2_130522	FD	BNASIM	Benzo(g,h,i)perylene	47 =		47 J		2	4.9	ug/Kg	TEMP

Appendix C
Benthic Data



Macroinvertebrate Results Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled Collection Date	Station T04-BN2 3 05/23/13	Station T06-BN2 3 05/23/13	Station T08-BN2 3 05/23/13	Station T10-BN1 3 05/23/13	Station T10-BN3 3 05/23/13	Station T12-BN1 3 05/23/13	Mean Values
Phylum: Cnidaria								
Class: Anthozoa								
Order: Actiniaria								
Family: Unspecified								
Number of Taxa	0	1	0	1	1	1	0	0
Number of Organisms per M ²	0	43	0	72	57	14	13	13
% Organisms (Sample Group)	0.0%	17.6%	0.0%	29.4%	23.5%	5.9%	N/A	N/A
% Organisms (This Station)	0.0%	5.8%	0.0%	7.7%	14.3%	1.1%	2.3%	2.3%
Class: Unspecified								
Order: Unspecified								
Family: Unspecified								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Phylum: Annelida								
Class: Polychaeta								
Order: Capitellida								
Family: Capitellidae								
Number of Taxa	1	1	1	1	0	1	1	1
Number of Organisms per M ²	517	287	560	43	0	86	95	95
% Organisms (Sample Group)	28.6%	15.9%	31%	2.4%	0.0%	4.8%	N/A	N/A
% Organisms (This Station)	44.4%	38.5%	37.9%	4.6%	0.0%	6.4%	8.5%	8.5%
Order: Cossurida								
Family: Cossuridae								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	4
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Order: Eunicida								
Family: Dorvilleidae								
Number of Taxa	0	0	0	1	0	0	0	0
Number of Organisms per M ²	0	0	0	29	0	0	0	18
% Organisms (Sample Group)	0.0%	0.0%	0.0%	8.3%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	3.1%	0.0%	0.0%	0.0%	1.2%
Family: Lumbrineridae								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	5
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Order: Orbiniida								
Family: Orbiniidae								
Number of Taxa	0	0	1	0	0	0	0	0
Number of Organisms per M ²	0	0	43	0	0	0	0	8
% Organisms (Sample Group)	0.0%	0.0%	27.3%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	2.9%	0.0%	0.0%	0.0%	0.0%	0.4%
Family: Paraonidae								



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T04-BN2	T06-BN2	T08-BN2	T10-BN1	T10-BN3	T12-BN1	Mean Values
			3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	
Number of Taxa			1	0	1	1	1	1	1
Number of Organisms per M ²			72	0	43	216	14	201	98
% Organisms (Sample Group)			3.8%	0.0%	2.3%	11.5%	0.8%	10.8%	N/A
% Organisms (This Station)			6.2%	0.0%	2.9%	23.1%	3.6%	14.9%	9.6%
Order: Phyllodocida									
Family: Glyceridae									
Number of Taxa			0	0	1	0	0	0	0
Number of Organisms per M ²			0	0	14	0	0	0	4
% Organisms (Sample Group)			0.0%	0.0%	20%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	1%	0.0%	0.0%	0.0%	0.3%
Family: Hesionidae									
Number of Taxa			0	1	0	1	1	1	1
Number of Organisms per M ²			0	14	0	115	14	29	40
% Organisms (Sample Group)			0.0%	1.9%	0.0%	15.1%	1.9%	3.8%	N/A
% Organisms (This Station)			0.0%	1.9%	0.0%	12.3%	3.6%	2.1%	5.3%
Family: Nereididae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	2
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Family: Pilargidae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	2
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Family: Syllidae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	88
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%
Order: Sabellida									
Family: Sabellidae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	2
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Order: Spionida									
Family: Magelonidae									
Number of Taxa			1	0	0	0	0	1	0
Number of Organisms per M ²			14	0	0	0	0	14	22
% Organisms (Sample Group)			3.4%	0.0%	0.0%	0.0%	0.0%	3.4%	N/A
% Organisms (This Station)			1.2%	0.0%	0.0%	0.0%	0.0%	1.1%	0.9%
Family: Spionidae									
Number of Taxa			1	0	0	1	1	3	1
Number of Organisms per M ²			14	0	0	14	14	43	27
% Organisms (Sample Group)			2.8%	0.0%	0.0%	2.8%	2.8%	8.3%	N/A
% Organisms (This Station)			1.2%	0.0%	0.0%	1.5%	3.6%	3.2%	1.5%



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T04-BN2	T06-BN2	T08-BN2	T10-BN1	T10-BN3	T12-BN1	Mean Values
Order: Terebellida									
Family: Cirratulidae									
Number of Taxa	0	3 05/23/13	0	0	2	3	2	3	2
Number of Organisms per M ²	0		0	0	201	72	72	632	552
% Organisms (Sample Group)	0.0%		0.0%	0.0%	1.9%	0.7%	0.7%	6%	N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	13.6%	7.7%	17.9%	46.8%	32.1%
Family: Sternaspidae									
Number of Taxa	0		0	0	1	0	1	0	0
Number of Organisms per M ²	0		0	0	43	0	14	0	7
% Organisms (Sample Group)	0.0%		0.0%	0.0%	33.3%	0.0%	11.1%	0.0%	N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	2.9%	0.0%	3.6%	0.0%	0.6%
Class: Clitellata									
Order: Haplotaxida									
Family: Tubificoid Naididae									
Number of Taxa	1		1	1	1	1	1	1	1
Number of Organisms per M ²	57		29	129	158	72	115	209	
% Organisms (Sample Group)	1.4%		0.7%	3.2%	4%	1.8%	2.9%	N/A	
% Organisms (This Station)	4.9%		3.8%	8.7%	16.9%	17.9%	8.5%		16.0%
Phylum: Arthropoda									
Class: Malacostraca									
Order: Amphipoda									
Family: Aoridae									
Number of Taxa	1		0	0	0	0	0	0	0
Number of Organisms per M ²	14		0	0	0	0	0	0	2
% Organisms (Sample Group)	33.3%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	1.2%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Order: Decapoda									
Family: Alpheidae									
Number of Taxa	0		0	0	0	0	0	0	0
Number of Organisms per M ²	0		0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Family: Palaemonidae									
Number of Taxa	0		0	0	0	0	0	0	0
Number of Organisms per M ²	0		0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Family: Penaeidae									
Number of Taxa	0		0	0	0	0	0	0	0
Number of Organisms per M ²	0		0	0	0	0	0	0	2
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Family: Upogebiidae									
Number of Taxa	0		1	0	0	0	1	0	0
Number of Organisms per M ²	0		14	0	0	0	14	6	
% Organisms (Sample Group)	0.0%		12.5%	0.0%	0.0%	0.0%	12.5%	N/A	
% Organisms (This Station)	0.0%		1.9%	0.0%	0.0%	0.0%	1.1%		0.4%



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station # of Replicates Pooled Collection Date	T04-BN2 3 05/23/13	T06-BN2 3 05/23/13	T08-BN2 3 05/23/13	T10-BN1 3 05/23/13	T10-BN3 3 05/23/13	T12-BN1 3 05/23/13	Mean Values
Family: Unspecified								
Number of Taxa	2	1	0	0	0	0	0	0
Number of Organisms per M ²	216	287	0	0	0	0	0	45
% Organisms (Sample Group)	25.4%	33.9%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	18.5%	38.5%	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%
Order: Mysida								
Family: Mysidae								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Phylum: Mollusca								
Class: Gastropoda								
Order: Cephalaspidea								
Family: Haminoeidae								
Number of Taxa	2	0	0	0	0	0	0	0
Number of Organisms per M ²	29	0	0	0	0	0	0	3
% Organisms (Sample Group)	50%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Order: Cycloneritimorpha								
Family: Neritidae								
Number of Taxa	1	0	0	0	0	0	0	0
Number of Organisms per M ²	14	0	0	0	0	0	0	1
% Organisms (Sample Group)	100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Order: Neogastropoda								
Family: Muricidae								
Number of Taxa	1	1	1	0	0	0	0	0
Number of Organisms per M ²	14	14	29	0	0	0	0	5
% Organisms (Sample Group)	14.3%	14.3%	28.6%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	1.2%	1.9%	1.9%	0.0%	0.0%	0.0%	0.0%	0.6%
Family: Olividae								
Number of Taxa	1	0	1	0	0	0	0	0
Number of Organisms per M ²	43	0	14	0	0	0	0	8
% Organisms (Sample Group)	27.3%	0.0%	9.1%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	3.7%	0.0%	1%	0.0%	0.0%	0.0%	0.0%	0.5%
Order: Neotaenioglossa								
Family: Caecidae								
Number of Taxa	0	0	0	0	1	1	1	0
Number of Organisms per M ²	0	0	0	0	14	29	29	3
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	25%	50%	50%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	3.6%	2.1%	2.1%	0.4%
Family: Calyptaeidae								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T04-BN2	T06-BN2	T08-BN2	T10-BN1	T10-BN3	T12-BN1	Mean Values
Family: Neritidae									
Number of Taxa	1	3 05/23/13	0	0	0	0	0	0	0
Number of Organisms per M ²	43	3 05/23/13	0	0	0	0	0	0	4
% Organisms (Sample Group)	60%	3 05/23/13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	3.7%	3 05/23/13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Order: Unspecified									
Family: Cylichnidae									
Number of Taxa	0	3 05/23/13	0	0	0	0	0	0	0
Number of Organisms per M ²	0	3 05/23/13	0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%	3 05/23/13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	3 05/23/13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Family: Unspecified									
Number of Taxa	0	3 05/23/13	0	0	0	0	0	0	0
Number of Organisms per M ²	0	3 05/23/13	0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%	3 05/23/13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	3 05/23/13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Class: Bivalvia									
Order: Arcoida									
Family: Noetiidae									
Number of Taxa	0	3 05/23/13	0	0	0	0	0	0	0
Number of Organisms per M ²	0	3 05/23/13	0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%	3 05/23/13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	3 05/23/13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Order: Nuculoida									
Family: Nuculanidae									
Number of Taxa	0	3 05/23/13	0	1	1	0	1	0	0
Number of Organisms per M ²	0	3 05/23/13	0	72	72	0	14	0	8
% Organisms (Sample Group)	0.0%	3 05/23/13	0.0%	45.5%	45.5%	0.0%	9.1%	0.0%	N/A
% Organisms (This Station)	0.0%	3 05/23/13	0.0%	4.9%	4.9%	0.0%	3.6%	0.0%	0.7%
Order: Veneroida									
Family: Corbulidae									
Number of Taxa	1	3 05/23/13	0	0	0	0	0	0	0
Number of Organisms per M ²	14	3 05/23/13	0	0	0	0	0	0	4
% Organisms (Sample Group)	20%	3 05/23/13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	1.2%	3 05/23/13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Family: Solecurtidae									
Number of Taxa	1	3 05/23/13	1	1	1	1	1	1	0
Number of Organisms per M ²	14	3 05/23/13	14	72	72	14	29	14	9
% Organisms (Sample Group)	8.3%	3 05/23/13	8.3%	41.7%	41.7%	8.3%	16.7%	8.3%	N/A
% Organisms (This Station)	1.2%	3 05/23/13	1.9%	4.9%	4.9%	1.5%	7.1%	1.1%	1.0%
Family: Tellinidae									
Number of Taxa	2	3 05/23/13	1	2	2	2	2	2	1
Number of Organisms per M ²	86	3 05/23/13	43	244	244	201	72	158	54
% Organisms (Sample Group)	8.5%	3 05/23/13	4.2%	23.9%	23.9%	19.7%	7%	15.5%	N/A
% Organisms (This Station)	7.4%	3 05/23/13	5.8%	16.5%	16.5%	21.5%	17.9%	11.7%	5.0%
Family: Veneridae									
Number of Taxa	0	3 05/23/13	0	1	1	0	1	0	0



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station # of Replicates Pooled Collection Date	T04-BN2 3 05/23/13	T06-BN2 3 05/23/13	T08-BN2 3 05/23/13	T10-BN1 3 05/23/13	T10-BN3 3 05/23/13	T12-BN1 3 05/23/13	Mean Values
Number of Organisms per M ²	0	0	14	0	14	0	0	3
% Organisms (Sample Group)	0.0%	0.0%	25%	0.0%	25%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	1%	0.0%	3.6%	0.0%	0.0%	0.3%
Order: Unspecified								
Family: Unspecified								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	20
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
Total Taxa	18	9	15	13	14	17	13	
Total Organisms per M²	1164	747	1480	934	402	1351	1379	
% Organisms (Sample Group)	4.4%	2.9%	5.6%	3.6%	1.5%	5.2%		N/A



Macroinvertebrate Results

Summary Table (Pooled)

		Prepared For: CH2M HILL Project: PTPLLC Cooling Water Canal Benthic Community Assessment		Sample Method: Petite Ponar Report Date: 07/25/2013				
		Sample Group: PTPLLC Cooling Water Canal Benthic Community						
Taxonomic Classification	# of Replicates Pooled Collection Date	Station T12-BN3 3 05/23/13	Station T14-BN1 3 05/23/13	Station T14-BN3 3 05/23/13	Station T16-BN1 3 05/23/13	Station T16-BN3 3 05/23/13	Station T18-BN1 3 05/23/13	Mean Values
Phylum: Cnidaria								
Class: Anthozoa								
Order: Actiniaria								
Family: Unspecified								
Number of Taxa		0	0	1	1	1	1	0
Number of Organisms per M ²		0	0	14	14	14	14	13
% Organisms (Sample Group)		0.0%	0.0%	5.9%	5.9%	5.9%	5.9%	N/A
% Organisms (This Station)		0.0%	0.0%	5.6%	1.3%	6.3%	0.8%	2.3%
Class: Unspecified								
Order: Unspecified								
Family: Unspecified								
Number of Taxa		1	0	0	0	0	0	0
Number of Organisms per M ²		14	0	0	0	0	0	1
% Organisms (Sample Group)		100%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)		2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Phylum: Annelida								
Class: Polychaeta								
Order: Capitellida								
Family: Capitellidae								
Number of Taxa		0	2	1	1	0	0	1
Number of Organisms per M ²		0	101	29	14	0	0	95
% Organisms (Sample Group)		0.0%	5.6%	1.6%	0.8%	0.0%	0.0%	N/A
% Organisms (This Station)		0.0%	8.1%	11.1%	1.3%	0.0%	0.0%	8.5%
Order: Cossurida								
Family: Cossuridae								
Number of Taxa		0	0	0	0	0	0	0
Number of Organisms per M ²		0	0	0	0	0	0	4
% Organisms (Sample Group)		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Order: Eunicida								
Family: Dorvilleidae								
Number of Taxa		1	1	0	0	0	0	0
Number of Organisms per M ²		14	14	0	0	0	0	18
% Organisms (Sample Group)		4.2%	4.2%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)		2.1%	1.2%	0.0%	0.0%	0.0%	0.0%	1.2%
Family: Lumbrineridae								
Number of Taxa		0	1	0	0	0	0	0
Number of Organisms per M ²		0	14	0	0	0	0	5
% Organisms (Sample Group)		0.0%	16.7%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)		0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.3%
Order: Orbiniida								
Family: Orbiniidae								
Number of Taxa		0	0	0	0	0	0	0
Number of Organisms per M ²		0	0	0	0	0	0	8
% Organisms (Sample Group)		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Family: Paraonidae								



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station # of Replicates Pooled Collection Date	T12-BN3 3 05/23/13	T14-BN1 3 05/23/13	T14-BN3 3 05/23/13	T16-BN1 3 05/23/13	T16-BN3 3 05/23/13	T18-BN1 3 05/23/13	Mean Values
Number of Taxa	1	1	1	1	1	1	1	1
Number of Organisms per M ²	72	172	57	187	72	129	98	
% Organisms (Sample Group)	3.8%	9.2%	3.1%	10%	3.8%	6.9%	N/A	
% Organisms (This Station)	10.4%	14%	22.2%	17.3%	31.3%	7.6%	9.6%	
Order: Phyllodocida								
Family: Glyceridae								
Number of Taxa	1	1	0	0	0	1	0	0
Number of Organisms per M ²	14	14	0	0	0	14	4	
% Organisms (Sample Group)	20%	20%	0.0%	0.0%	0.0%	20%	N/A	
% Organisms (This Station)	2.1%	1.2%	0.0%	0.0%	0.0%	0.8%	0.3%	
Family: Hesionidae								
Number of Taxa	1	2	0	2	1	1	1	1
Number of Organisms per M ²	201	144	0	115	57	14	40	
% Organisms (Sample Group)	26.4%	18.9%	0.0%	15.1%	7.5%	1.9%	N/A	
% Organisms (This Station)	29.2%	11.6%	0.0%	10.7%	25%	0.8%	5.3%	
Family: Nereididae								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	2
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A	
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	
Family: Pilargidae								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	2
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A	
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	
Family: Syllidae								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	88
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A	
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	
Order: Sabellida								
Family: Sabellidae								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	2
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A	
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	
Order: Spionida								
Family: Magelonidae								
Number of Taxa	0	1	0	0	0	0	0	0
Number of Organisms per M ²	0	29	0	0	0	0	0	22
% Organisms (Sample Group)	0.0%	6.9%	0.0%	0.0%	0.0%	0.0%	N/A	
% Organisms (This Station)	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.9%	
Family: Spionidae								
Number of Taxa	0	2	0	1	0	1	1	1
Number of Organisms per M ²	0	57	0	29	0	14	27	
% Organisms (Sample Group)	0.0%	11.1%	0.0%	5.6%	0.0%	2.8%	N/A	
% Organisms (This Station)	0.0%	4.7%	0.0%	2.7%	0.0%	0.8%	1.5%	



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T12-BN3	T14-BN1	T14-BN3	T16-BN1	T16-BN3	T18-BN1	Mean Values
Order: Terebellida									
Family: Cirratulidae									
Number of Taxa	2	3 05/23/13	3 05/23/13	2 05/23/13	2 05/23/13	1 05/23/13	4 05/23/13	2 05/23/13	2
Number of Organisms per M ²	259		316	101	647	72	1279		552
% Organisms (Sample Group)	2.5%		3%	1%	6.2%	0.7%	12.2%		N/A
% Organisms (This Station)	37.5%		25.6%	38.9%	60%	31.3%	74.8%		32.1%
Family: Sternaspidae									
Number of Taxa	0		0	0	0	0	1		0
Number of Organisms per M ²	0		0	0	0	0	57		7
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	44.4%		N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	3.4%		0.6%
Class: Clitellata									
Order: Haplotaxida									
Family: Tubificoid Naididae									
Number of Taxa	1		1	1	1	0	1		1
Number of Organisms per M ²	57		230	43	43	0	129		209
% Organisms (Sample Group)	1.4%		5.8%	1.1%	1.1%	0.0%	3.2%		N/A
% Organisms (This Station)	8.3%		18.6%	16.7%	4%	0.0%	7.6%		16.0%
Phylum: Arthropoda									
Class: Malacostraca									
Order: Amphipoda									
Family: Aoridae									
Number of Taxa	0		0	0	0	0	0		0
Number of Organisms per M ²	0		0	0	0	0	0		2
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%		N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%		0.1%
Order: Decapoda									
Family: Alpheidae									
Number of Taxa	0		1	0	0	0	0		0
Number of Organisms per M ²	0		14	0	0	0	0		1
% Organisms (Sample Group)	0.0%		100%	0.0%	0.0%	0.0%	0.0%		N/A
% Organisms (This Station)	0.0%		1.2%	0.0%	0.0%	0.0%	0.0%		0.1%
Family: Palaemonidae									
Number of Taxa	0		0	0	0	0	1		0
Number of Organisms per M ²	0		0	0	0	0	14		1
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	100%		N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.8%		0.0%
Family: Penaeidae									
Number of Taxa	0		0	0	0	0	0		0
Number of Organisms per M ²	0		0	0	0	0	0		2
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%		N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%		0.1%
Family: Upogebiidae									
Number of Taxa	0		1	0	0	0	1		0
Number of Organisms per M ²	0		14	0	0	0	14		6
% Organisms (Sample Group)	0.0%		12.5%	0.0%	0.0%	0.0%	12.5%		N/A
% Organisms (This Station)	0.0%		1.2%	0.0%	0.0%	0.0%	0.8%		0.4%



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station # of Replicates Pooled Collection Date	T12-BN3 3 05/23/13	T14-BN1 3 05/23/13	T14-BN3 3 05/23/13	T16-BN1 3 05/23/13	T16-BN3 3 05/23/13	T18-BN1 3 05/23/13	Mean Values
Family: Unspecified								
Number of Taxa	0	0	0	0	1	0	0	0
Number of Organisms per M ²	0	0	0	0	14	0	0	45
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%	0.0%	4.0%
Order: Mysida								
Family: Mysidae								
Number of Taxa	0	0	0	1	0	0	0	0
Number of Organisms per M ²	0	0	0	14	0	0	0	1
% Organisms (Sample Group)	0.0%	0.0%	0.0%	100%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.1%
Phylum: Mollusca								
Class: Gastropoda								
Order: Cephalaspidea								
Family: Haminoeidae								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	3
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Order: Cycloneritimorpha								
Family: Neritidae								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Order: Neogastropoda								
Family: Muricidae								
Number of Taxa	0	0	1	0	0	0	0	0
Number of Organisms per M ²	0	0	14	0	0	0	0	5
% Organisms (Sample Group)	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	5.6%	0.0%	0.0%	0.0%	0.0%	0.6%
Family: Olividae								
Number of Taxa	0	1	0	0	0	0	0	0
Number of Organisms per M ²	0	14	0	0	0	0	0	8
% Organisms (Sample Group)	0.0%	9.1%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
Order: Neotaenioglossa								
Family: Caecidae								
Number of Taxa	0	1	0	0	0	0	0	0
Number of Organisms per M ²	0	14	0	0	0	0	0	3
% Organisms (Sample Group)	0.0%	25%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Family: Calyptraeidae								
Number of Taxa	0	1	0	0	0	0	0	0
Number of Organisms per M ²	0	14	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%	100%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T12-BN3	T14-BN1	T14-BN3	T16-BN1	T16-BN3	T18-BN1	Mean Values
Family: Neritidae									
Number of Taxa	0	3 05/23/13	0	1 05/23/13	0 05/23/13	0 05/23/13	0 05/23/13	0 05/23/13	0
Number of Organisms per M ²	0		29	0	0	0	0	0	4
% Organisms (Sample Group)	0.0%		40%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%		2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Order: Unspecified									
Family: Cylichnidae									
Number of Taxa	0		0	0	0	0	0	0	0
Number of Organisms per M ²	0		0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Family: Unspecified									
Number of Taxa	0		0	0	0	0	0	0	0
Number of Organisms per M ²	0		0	0	0	0	0	0	1
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Class: Bivalvia									
Order: Arcoida									
Family: Noetiidae									
Number of Taxa	0		0	0	0	0	0	1	0
Number of Organisms per M ²	0		0	0	0	0	0	14	1
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	100%	N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%
Order: Nuculoida									
Family: Nuculanidae									
Number of Taxa	1		0	0	0	0	0	0	0
Number of Organisms per M ²	14		0	0	0	0	0	0	8
% Organisms (Sample Group)	9.1%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	2.1%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%
Order: Veneroida									
Family: Corbulidae									
Number of Taxa	0		1	0	1	0	1	0	0
Number of Organisms per M ²	0		14	0	14	0	14	0	4
% Organisms (Sample Group)	0.0%		20%	0.0%	20%	0.0%	20%	0.0%	N/A
% Organisms (This Station)	0.0%		1.2%	0.0%	1.3%	0.0%	0.8%	0.0%	0.3%
Family: Solecurtidae									
Number of Taxa	1		0	0	0	0	0	0	0
Number of Organisms per M ²	14		0	0	0	0	0	0	9
% Organisms (Sample Group)	8.3%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	2.1%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%
Family: Tellinidae									
Number of Taxa	2		1	0	0	0	0	0	1
Number of Organisms per M ²	29		14	0	0	0	0	0	54
% Organisms (Sample Group)	2.8%		1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	4.2%		1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%
Family: Veneridae									
Number of Taxa	0		1	0	0	0	0	0	0



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station # of Replicates Pooled Collection Date	T12-BN3 3 05/23/13	T14-BN1 3 05/23/13	T14-BN3 3 05/23/13	T16-BN1 3 05/23/13	T16-BN3 3 05/23/13	T18-BN1 3 05/23/13	Mean Values
Number of Organisms per M ²	0	14	0	0	0	0	0	3
% Organisms (Sample Group)	0.0%	25%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Order: Unspecified								
Family: Unspecified								
Number of Taxa	0	0	0	0	0	0	0	0
Number of Organisms per M ²	0	0	0	0	0	0	0	20
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
Total Taxa	12	24	7	11	5	15	13	
Total Organisms per M²	690	1236	259	1078	230	1710	1379	
% Organisms (Sample Group)	2.6%	4.7%	1%	4.1%	0.9%	6.5%		N/A



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T18-BN3	T20-BN1	T20-BN3	BKG-BN1	BKG-BN2	BKG-BN3	Mean Values
			3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/21/13	
Phylum: Cnidaria									
Class: Anthozoa									
Order: Actiniaria									
Family: Unspecified									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	13
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%
Class: Unspecified									
Order: Unspecified									
Family: Unspecified									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	1
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Phylum: Annelida									
Class: Polychaeta									
Order: Capitellida									
Family: Capitellidae									
Number of Taxa			1	2	0	1	2	0	1
Number of Organisms per M ²			14	72	0	14	72	0	95
% Organisms (Sample Group)			0.8%	4%	0.0%	0.8%	4%	0.0%	N/A
% Organisms (This Station)			0.8%	3%	0.0%	2%	2.3%	0.0%	8.5%
Order: Cossurida									
Family: Cossuridae									
Number of Taxa			1	0	0	0	0	0	0
Number of Organisms per M ²			72	0	0	0	0	0	4
% Organisms (Sample Group)			100%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Order: Eunicida									
Family: Dorvilleidae									
Number of Taxa			0	0	1	0	0	1	0
Number of Organisms per M ²			0	0	14	0	0	129	18
% Organisms (Sample Group)			0.0%	0.0%	4.2%	0.0%	0.0%	37.5%	N/A
% Organisms (This Station)			0.0%	0.0%	0.4%	0.0%	0.0%	6.9%	1.2%
Family: Lumbrineridae									
Number of Taxa			1	0	0	1	1	0	0
Number of Organisms per M ²			14	0	0	14	43	0	5
% Organisms (Sample Group)			16.7%	0.0%	0.0%	16.7%	50%	0.0%	N/A
% Organisms (This Station)			0.8%	0.0%	0.0%	2%	1.4%	0.0%	0.3%
Order: Orbiniida									
Family: Orbiniidae									
Number of Taxa			1	1	2	0	0	0	0
Number of Organisms per M ²			29	43	43	0	0	0	8
% Organisms (Sample Group)			18.2%	27.3%	27.3%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			1.7%	1.8%	1.2%	0.0%	0.0%	0.0%	0.4%
Family: Paraonidae									



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
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 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T18-BN3	T20-BN1	T20-BN3	BKG-BN1	BKG-BN2	BKG-BN3	Mean Values
			3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/21/13	
Number of Taxa			1	1	1	0	0	0	1
Number of Organisms per M ²			201	388	29	0	0	0	98
% Organisms (Sample Group)			10.8%	20.8%	1.5%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			11.6%	16.4%	0.8%	0.0%	0.0%	0.0%	9.6%
Order: Phyllodocida									
Family: Glyceridae									
Number of Taxa			0	1	0	0	0	0	0
Number of Organisms per M ²			0	14	0	0	0	0	4
% Organisms (Sample Group)			0.0%	20%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.3%
Family: Hesionidae									
Number of Taxa			1	0	0	0	0	0	1
Number of Organisms per M ²			57	0	0	0	0	0	40
% Organisms (Sample Group)			7.5%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	5.3%
Family: Nereididae									
Number of Taxa			0	0	0	1	1	0	0
Number of Organisms per M ²			0	0	0	29	14	0	2
% Organisms (Sample Group)			0.0%	0.0%	0.0%	66.7%	33.3%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	4.1%	0.5%	0.0%	0.2%
Family: Pilargidae									
Number of Taxa			0	2	0	0	0	0	0
Number of Organisms per M ²			0	29	0	0	0	0	2
% Organisms (Sample Group)			0.0%	100%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.1%
Family: Syllidae									
Number of Taxa			0	0	0	0	0	1	0
Number of Organisms per M ²			0	0	0	0	0	934	88
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	55.6%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	50%	5.0%
Order: Sabellida									
Family: Sabellidae									
Number of Taxa			0	2	0	0	0	0	0
Number of Organisms per M ²			0	29	0	0	0	0	2
% Organisms (Sample Group)			0.0%	100%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.1%
Order: Spionida									
Family: Magelonidae									
Number of Taxa			1	1	1	0	1	0	0
Number of Organisms per M ²			14	144	187	0	14	0	22
% Organisms (Sample Group)			3.4%	34.5%	44.8%	0.0%	3.4%	0.0%	N/A
% Organisms (This Station)			0.8%	6.1%	5.3%	0.0%	0.5%	0.0%	0.9%
Family: Spionidae									
Number of Taxa			0	1	1	0	2	0	1
Number of Organisms per M ²			0	43	14	0	273	0	27
% Organisms (Sample Group)			0.0%	8.3%	2.8%	0.0%	52.8%	0.0%	N/A
% Organisms (This Station)			0.0%	1.8%	0.4%	0.0%	8.8%	0.0%	1.5%



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T18-BN3	T20-BN1	T20-BN3	BKG-BN1	BKG-BN2	BKG-BN3	Mean Values
			3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/21/13	
Order: Terebellida									
Family: Cirratulidae									
Number of Taxa	3		4	2	2	3	0	2	
Number of Organisms per M ²	1149		1437	3147	29	1078	0	552	
% Organisms (Sample Group)	11%		13.7%	30%	0.3%	10.3%	0.0%	N/A	
% Organisms (This Station)	66.1%		60.6%	90.1%	4.1%	34.7%	0.0%	32.1%	
Family: Sternaspidae									
Number of Taxa	0		1	0	0	0	0	0	
Number of Organisms per M ²	0		14	0	0	0	0	7	
% Organisms (Sample Group)	0.0%		11.1%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%		0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Class: Clitellata									
Order: Haplotaxida									
Family: Tubificoid Naididae									
Number of Taxa	1		1	1	2	1	1	1	
Number of Organisms per M ²	57		43	14	603	1164	517	209	
% Organisms (Sample Group)	1.4%		1.1%	0.4%	15.2%	29.2%	13%	N/A	
% Organisms (This Station)	3.3%		1.8%	0.4%	85.7%	37.5%	27.7%	16.0%	
Phylum: Arthropoda									
Class: Malacostraca									
Order: Amphipoda									
Family: Aoridae									
Number of Taxa	1		0	0	0	1	0	0	
Number of Organisms per M ²	14		0	0	0	14	0	2	
% Organisms (Sample Group)	33.3%		0.0%	0.0%	0.0%	33.3%	0.0%	N/A	
% Organisms (This Station)	0.8%		0.0%	0.0%	0.0%	0.5%	0.0%	0.1%	
Order: Decapoda									
Family: Alpheidae									
Number of Taxa	0		0	0	0	0	0	0	
Number of Organisms per M ²	0		0	0	0	0	0	1	
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Family: Palaemonidae									
Number of Taxa	0		0	0	0	0	0	0	
Number of Organisms per M ²	0		0	0	0	0	0	1	
% Organisms (Sample Group)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Family: Penaeidae									
Number of Taxa	1		0	0	0	2	0	0	
Number of Organisms per M ²	14		0	0	0	29	0	2	
% Organisms (Sample Group)	33.3%		0.0%	0.0%	0.0%	66.7%	0.0%	N/A	
% Organisms (This Station)	0.8%		0.0%	0.0%	0.0%	0.9%	0.0%	0.1%	
Family: Upogebiidae									
Number of Taxa	2		1	0	0	0	0	0	
Number of Organisms per M ²	43		14	0	0	0	0	6	
% Organisms (Sample Group)	37.5%		12.5%	0.0%	0.0%	0.0%	0.0%	N/A	
% Organisms (This Station)	2.5%		0.6%	0.0%	0.0%	0.0%	0.0%	0.4%	



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T18-BN3	T20-BN1	T20-BN3	BKG-BN1	BKG-BN2	BKG-BN3	Mean Values
			3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/21/13	
Family: Unspecified									
Number of Taxa			1	0	0	1	1	0	0
Number of Organisms per M ²			14	0	0	14	302	0	45
% Organisms (Sample Group)			1.7%	0.0%	0.0%	1.7%	35.6%	0.0%	N/A
% Organisms (This Station)			0.8%	0.0%	0.0%	2%	9.7%	0.0%	4.0%
Order: Mysida									
Family: Mysidae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	1
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Phylum: Mollusca									
Class: Gastropoda									
Order: Cephalaspidea									
Family: Haminoeidae									
Number of Taxa			1	0	0	0	0	0	0
Number of Organisms per M ²			29	0	0	0	0	0	3
% Organisms (Sample Group)			50%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Order: Cycloneritimorpha									
Family: Neritidae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	1
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Order: Neogastropoda									
Family: Muricidae									
Number of Taxa			0	1	1	0	0	0	0
Number of Organisms per M ²			0	14	14	0	0	0	5
% Organisms (Sample Group)			0.0%	14.3%	14.3%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.6%	0.4%	0.0%	0.0%	0.0%	0.6%
Family: Olividae									
Number of Taxa			0	1	0	0	1	0	0
Number of Organisms per M ²			0	72	0	0	14	0	8
% Organisms (Sample Group)			0.0%	45.5%	0.0%	0.0%	9.1%	0.0%	N/A
% Organisms (This Station)			0.0%	3%	0.0%	0.0%	0.5%	0.0%	0.5%
Order: Neotaenioglossa									
Family: Caecidae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	3
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Family: Calyptraeidae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	1
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T18-BN3	T20-BN1	T20-BN3	BKG-BN1	BKG-BN2	BKG-BN3	Mean Values
			3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/23/13	3 05/21/13	
Family: Neritidae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	4
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Order: Unspecified									
Family: Cylichnidae									
Number of Taxa			0	0	0	0	1	0	0
Number of Organisms per M ²			0	0	0	0	14	0	1
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	100%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%
Family: Unspecified									
Number of Taxa			0	0	0	0	1	0	0
Number of Organisms per M ²			0	0	0	0	14	0	1
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	100%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%
Class: Bivalvia									
Order: Arcoida									
Family: Noetiidae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	1
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Order: Nuculoida									
Family: Nuculanidae									
Number of Taxa			1	1	0	0	1	0	0
Number of Organisms per M ²			14	14	0	0	29	0	8
% Organisms (Sample Group)			9.1%	9.1%	0.0%	0.0%	18.2%	0.0%	N/A
% Organisms (This Station)			0.8%	0.6%	0.0%	0.0%	0.9%	0.0%	0.7%
Order: Veneroida									
Family: Corbulidae									
Number of Taxa			0	0	1	0	0	0	0
Number of Organisms per M ²			0	0	14	0	0	0	4
% Organisms (Sample Group)			0.0%	0.0%	20%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.3%
Family: Solecurtidae									
Number of Taxa			0	0	0	0	0	0	0
Number of Organisms per M ²			0	0	0	0	0	0	9
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%
Family: Tellinidae									
Number of Taxa			0	0	0	0	2	1	1
Number of Organisms per M ²			0	0	0	0	29	72	54
% Organisms (Sample Group)			0.0%	0.0%	0.0%	0.0%	2.8%	7%	N/A
% Organisms (This Station)			0.0%	0.0%	0.0%	0.0%	0.9%	3.8%	5.0%
Family: Veneridae									
Number of Taxa			0	0	1	0	0	0	0



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station # of Replicates Pooled Collection Date	T18-BN3 3 05/23/13	T20-BN1 3 05/23/13	T20-BN3 3 05/23/13	BKG-BN1 3 05/23/13	BKG-BN2 3 05/23/13	BKG-BN3 3 05/21/13	Mean Values
Number of Organisms per M ²	0	0	14	0	0	0	0	3
% Organisms (Sample Group)	0.0%	0.0%	25%	0.0%	0.0%	0.0%	0.0%	N/A
% Organisms (This Station)	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.3%
Order: Unspecified								
Family: Unspecified								
Number of Taxa	0	0	0	0	0	1	0	0
Number of Organisms per M ²	0	0	0	0	0	216	20	
% Organisms (Sample Group)	0.0%	0.0%	0.0%	0.0%	0.0%	57.7%	N/A	
% Organisms (This Station)	0.0%	0.0%	0.0%	0.0%	0.0%	11.5%	1.1%	
Total Taxa	18	21	12	8	21	5	13	
Total Organisms per M²	1739	2371	3491	704	3103	1868	1379	
% Organisms (Sample Group)	6.6%	9%	13.3%	2.7%	11.8%	7.1%	N/A	



Macroinvertebrate Results

Summary Table (Pooled)

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 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station # of Replicates Pooled Collection Date	BKG-BN4 3 05/21/13	Mean Values
Phylum: Cnidaria			
Class: Anthozoa			
Order: Actiniaria			
Family: Unspecified			
Number of Taxa	0	0	0
Number of Organisms per M ²	0	13	
% Organisms (Sample Group)	0.0%	N/A	
% Organisms (This Station)	0.0%	2.3%	
Class: Unspecified			
Order: Unspecified			
Family: Unspecified			
Number of Taxa	0	0	0
Number of Organisms per M ²	0	1	
% Organisms (Sample Group)	0.0%	N/A	
% Organisms (This Station)	0.0%	0.1%	
Phylum: Annelida			
Class: Polychaeta			
Order: Capitellida			
Family: Capitellidae			
Number of Taxa	0	1	
Number of Organisms per M ²	0	95	
% Organisms (Sample Group)	0.0%	N/A	
% Organisms (This Station)	0.0%	8.5%	
Order: Cossurida			
Family: Cossuridae			
Number of Taxa	0	0	0
Number of Organisms per M ²	0	4	
% Organisms (Sample Group)	0.0%	N/A	
% Organisms (This Station)	0.0%	0.2%	
Order: Eunicida			
Family: Dorvilleidae			
Number of Taxa	2	0	
Number of Organisms per M ²	144	18	
% Organisms (Sample Group)	41.7%	N/A	
% Organisms (This Station)	8.7%	1.2%	
Family: Lumbrineridae			
Number of Taxa	0	0	
Number of Organisms per M ²	0	5	
% Organisms (Sample Group)	0.0%	N/A	
% Organisms (This Station)	0.0%	0.3%	
Order: Orbiniida			
Family: Orbiniidae			
Number of Taxa	0	0	
Number of Organisms per M ²	0	8	
% Organisms (Sample Group)	0.0%	N/A	
% Organisms (This Station)	0.0%	0.4%	
Family: Paraonidae			



Macroinvertebrate Results

Summary Table (Pooled)

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Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
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 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station # of Replicates Pooled Collection Date	BKG-BN4 3 05/21/13	Mean Values
Number of Taxa		1	1
Number of Organisms per M ²		14	98
% Organisms (Sample Group)		0.8%	N/A
% Organisms (This Station)		0.9%	9.6%
Order: Phyllodocida			
Family: Glyceridae			
Number of Taxa		0	0
Number of Organisms per M ²		0	4
% Organisms (Sample Group)		0.0%	N/A
% Organisms (This Station)		0.0%	0.3%
Family: Hesionidae			
Number of Taxa		0	1
Number of Organisms per M ²		0	40
% Organisms (Sample Group)		0.0%	N/A
% Organisms (This Station)		0.0%	5.3%
Family: Nereididae			
Number of Taxa		0	0
Number of Organisms per M ²		0	2
% Organisms (Sample Group)		0.0%	N/A
% Organisms (This Station)		0.0%	0.2%
Family: Pilargidae			
Number of Taxa		0	0
Number of Organisms per M ²		0	2
% Organisms (Sample Group)		0.0%	N/A
% Organisms (This Station)		0.0%	0.1%
Family: Syllidae			
Number of Taxa		1	0
Number of Organisms per M ²		747	88
% Organisms (Sample Group)		44.4%	N/A
% Organisms (This Station)		45.2%	5.0%
Order: Sabellida			
Family: Sabellidae			
Number of Taxa		0	0
Number of Organisms per M ²		0	2
% Organisms (Sample Group)		0.0%	N/A
% Organisms (This Station)		0.0%	0.1%
Order: Spionida			
Family: Magelonidae			
Number of Taxa		0	0
Number of Organisms per M ²		0	22
% Organisms (Sample Group)		0.0%	N/A
% Organisms (This Station)		0.0%	0.9%
Family: Spionidae			
Number of Taxa		0	1
Number of Organisms per M ²		0	27
% Organisms (Sample Group)		0.0%	N/A
% Organisms (This Station)		0.0%	1.5%



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	BKG-BN4	Mean Values
Order: Terebellida				
Family: Cirratulidae				
Number of Taxa			0	2
Number of Organisms per M ²			0	552
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	32.1%
Family: Sternaspidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	7
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.6%
Class: Clitellata				
Order: Haplotaxida				
Family: Tubificoid Naididae				
Number of Taxa			1	1
Number of Organisms per M ²			517	209
% Organisms (Sample Group)			13%	N/A
% Organisms (This Station)			31.3%	16.0%
Phylum: Arthropoda				
Class: Malacostraca				
Order: Amphipoda				
Family: Aoridae				
Number of Taxa			0	0
Number of Organisms per M ²			0	2
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.1%
Order: Decapoda				
Family: Alpheidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	1
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.1%
Family: Palaemonidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	1
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.0%
Family: Penaeidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	2
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.1%
Family: Upogebiidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	6
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.4%



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	BKG-BN4	Mean Values
Family: Unspecified				
Number of Taxa			0	0
Number of Organisms per M ²			0	45
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	4.0%
Order: Mysida				
Family: Mysidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	1
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.1%
Phylum: Mollusca				
Class: Gastropoda				
Order: Cephalaspidea				
Family: Haminoeidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	3
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.2%
Order: Cycloneritimorpha				
Family: Neritidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	1
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.1%
Order: Neogastropoda				
Family: Muricidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	5
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.6%
Family: Olividae				
Number of Taxa			0	0
Number of Organisms per M ²			0	8
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.5%
Order: Neotaenioglossa				
Family: Caecidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	3
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.4%
Family: Calyptaeidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	1
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.1%



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	BKG-BN4	Mean Values
Family: Neritidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	4
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.3%
Order: Unspecified				
Family: Cylichnidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	1
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.0%
Family: Unspecified				
Number of Taxa			0	0
Number of Organisms per M ²			0	1
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.0%
Class: Bivalvia				
Order: Arcoida				
Family: Noetiidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	1
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.0%
Order: Nuculoida				
Family: Nuculanidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	8
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.7%
Order: Veneroida				
Family: Corbulidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	4
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	0.3%
Family: Solecurtidae				
Number of Taxa			0	0
Number of Organisms per M ²			0	9
% Organisms (Sample Group)			0.0%	N/A
% Organisms (This Station)			0.0%	1.0%
Family: Tellinidae				
Number of Taxa			2	1
Number of Organisms per M ²			72	54
% Organisms (Sample Group)			7%	N/A
% Organisms (This Station)			4.3%	5.0%
Family: Veneridae				
Number of Taxa			0	0



Macroinvertebrate Results

Summary Table (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station # of Replicates Pooled Collection Date	BKG-BN4 3 05/21/13	Mean Values
Number of Organisms per M ²		0	3
% Organisms (Sample Group)		0.0%	N/A
% Organisms (This Station)		0.0%	0.3%
Order: Unspecified			
Family: Unspecified			
Number of Taxa		1	0
Number of Organisms per M ²		158	20
% Organisms (Sample Group)		42.3%	N/A
% Organisms (This Station)		9.6%	1.1%
Total Taxa		8	13
Total Organisms per M²		1652	1379
% Organisms (Sample Group)		6.3%	N/A



6821 SW Archer Road
Gainesville, FL 32608
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Macroinvertebrate Results

Client: CH2M HILL
Project: PTPLLC Cooling Water Canal Benthic Community Assessment
Sample Group: PTPLLC Cooling Water Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013
Report Type: Station Indices (Pooled)

Station	T04-BN2	T06-BN2	T08-BN2	T10-BN1	T10-BN3	T12-BN1	T12-BN3	T14-BN1	T14-BN3	T16-BN1	T16-BN3	T18-BN1	T18-BN3	T20-BN1	T20-BN3	BKG-BN1	BKG-BN2	BKG-BN3	BKG-BN4
# Replicates	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
Pooled Collection Date	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/23/13	05/21/13	05/21/13	

Shannon Diversity Index (H') Base e: $H' = [\sum (n_i / n) * \ln(n_i / n)]$	1.997	1.493	2.159	2.220	2.463	2.047	1.992	2.617	1.831	1.429	1.420	1.802	1.891	1.999	0.870	0.756	1.984	1.261	1.426
Pielou's Evenness (J') $J' = H' / H'_{\max}$	0.691	0.680	0.797	0.865	0.933	0.722	0.802	0.823	0.941	0.596	0.882	0.666	0.654	0.657	0.350	0.364	0.652	0.784	0.686
McIntosh's Dominance (M) $M = (n - \sqrt{\sum n_i^2}) / (n - \sqrt{n})$	0.572	0.519	0.634	0.726	0.844	0.596	0.677	0.758	0.764	0.429	0.646	0.559	0.566	0.592	0.236	0.188	0.582	0.451	0.482
Margalef's Richness Index (D) $D = (S - 1) / \ln(N)$	3.869	2.025	3.021	2.875	3.901	3.522	2.841	5.163	2.076	2.316	1.443	2.929	3.545	3.917	2.003	1.799	3.721	0.822	1.475
Number of Taxa	18	9	15	13	14	17	12	24	7	11	5	15	18	21	12	8	21	5	8
Number of Genera	16	9	14	12	14	16	12	24	7	11	5	15	17	21	11	8	19	5	8



Prepared For: CH2M HILL
Project Name: PTPLLC Cooling Water Canal Benthic Community Assessment
Sample Group: PTPLLC Cooling Water Canal Benthic Community
Number per Sq. Meter

Sample Method: Petite Ponar
Conversion Factor: 0.0232
Report Generated: 07/25/2013



Prepared For: CH2M HILL
Project Name: PTPLLC Cooling Water Canal Benthic Community Assessment
Sample Group: PTPLLC Cooling Water Canal Benthic Community
Number per Sq. Meter

Sample Method: Petite Ponar
Conversion Factor: 0.0232
Report Generated: 07/25/2013



Macroinvertebrate Results

Feeding Guild Analysis (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled Collection Date	Station T04-BN2 3 05/23/13	Station T06-BN2 3 05/23/13	Station T08-BN2 3 05/23/13	Station T10-BN1 3 05/23/13	Station T10-BN3 3 05/23/13	Station T12-BN1 3 05/23/13	Mean Values
Collector-Filterer / Suspension Feeder								
Total Individuals		122.1	71.8	402.3	222.7	136.5	208.3	121.7
Percent Abundance		10.49%	9.62%	27.18%	23.85%	33.93%	15.43%	9.96%
Number of Taxa		5	3	5	4	6	7	4
Subsurface Collector-Gatherer / Deposit Feeder								
Total Individuals		646.6	316.1	819	416.7	114.9	431	425
Percent Abundance		55.56%	42.31%	55.34%	44.62%	28.57%	31.91%	35.6%
Number of Taxa		3	2	5	3	4	4	3
Epibenthic Collector-Gatherer / Deposit Feeder								
Total Individuals		21.6	0	201.1	79	79	668.1	632.9
Percent Abundance		1.85%	0%	13.59%	8.46%	19.64%	49.47%	36.38%
Number of Taxa		2	0	2	4	3	7	3
Predator / Carnivore								
Total Individuals		14.4	71.8	43.1	215.5	71.8	43.1	131.6
Percent Abundance		1.23%	9.62%	2.91%	23.08%	17.86%	3.19%	12.61%
Number of Taxa		1	3	2	3	2	2	3
Scraper								
Total Individuals		114.9	0	14.4	0	0	0	15.9
Percent Abundance		9.88%	0%	0.97%	0%	0%	0%	1.05%
Number of Taxa		4	0	1	0	0	0	1
Browser-Grazer								
Total Individuals		114.9	143.7	0	0	0	0	25.3
Percent Abundance		9.88%	19.23%	0%	0%	0%	0%	2.16%
Number of Taxa		3	1	0	0	0	0	1
Scavenger (Animals)								
Total Individuals		114.9	143.7	0	0	0	0	25.3
Percent Abundance		9.88%	19.23%	0%	0%	0%	0%	2.16%
Number of Taxa		3	1	0	0	0	0	1
Unspecified								
Total Individuals		14	0	0	0	0	0	2
Percent Abundance		1.23%	0%	0%	0%	0%	0%	0.09%
Number of Taxa		1	0	0	0	0	0	0
Totals								
Total Individuals		1164	747	1480	934	402	1351	1379
Number of Taxa		18	9	15	13	14	17	13



Macroinvertebrate Results

Feeding Guild Analysis (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment

Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T12-BN3	T14-BN1	T14-BN3	T16-BN1	T16-BN3	T18-BN1	Mean Values
Collector-Filterer / Suspension Feeder									
Total Individuals			71.8	100.6	0	43.1	0	50.3	121.7
Percent Abundance			10.42%	8.14%	0%	4%	0%	2.94%	9.96%
Number of Taxa			5	7	0	3	0	4	4
Subsurface Collector-Gatherer / Deposit Feeder									
Total Individuals			129.3	517.2	129.3	244.3	71.8	316.1	425
Percent Abundance			18.75%	41.86%	50%	22.67%	31.25%	18.49%	35.6%
Number of Taxa			2	5	3	3	1	3	3
Epibenthic Collector-Gatherer / Deposit Feeder									
Total Individuals			258.6	373.6	100.6	660.9	71.8	1285.9	632.9
Percent Abundance			37.5%	30.23%	38.89%	61.33%	31.25%	75.21%	36.38%
Number of Taxa			2	6	2	3	1	5	3
Predator / Carnivore									
Total Individuals			229.9	186.8	28.7	129.3	71.8	43.1	131.6
Percent Abundance			33.33%	15.12%	11.11%	12%	31.25%	2.52%	12.61%
Number of Taxa			3	5	2	3	2	3	3
Scraper									
Total Individuals			0	43.1	0	0	0	0	15.9
Percent Abundance			0%	3.49%	0%	0%	0%	0%	1.05%
Number of Taxa			0	2	0	0	0	0	1
Browser-Grazer									
Total Individuals			0	7.2	0	0	7.2	7.2	25.3
Percent Abundance			0%	0.58%	0%	0%	3.13%	0.42%	2.16%
Number of Taxa			0	1	0	0	1	1	1
Scavenger (Animals)									
Total Individuals			0	7.2	0	0	7.2	7.2	25.3
Percent Abundance			0%	0.58%	0%	0%	3.13%	0.42%	2.16%
Number of Taxa			0	1	0	0	1	1	1
Unspecified									
Total Individuals			0	0	0	0	0	0	2
Percent Abundance			0%	0%	0%	0%	0%	0%	0.09%
Number of Taxa			0	0	0	0	0	0	0
Totals									
Total Individuals			690	1236	259	1078	230	1710	1379
Number of Taxa			12	24	7	11	5	15	13



Macroinvertebrate Results

Feeding Guild Analysis (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	# of Replicates Pooled	Station Collection Date	T18-BN3	T20-BN1	T20-BN3	BKG-BN1	BKG-BN2	BKG-BN3	Mean Values
Collector-Filterer / Suspension Feeder									
Total Individuals		3	57.5	79	35.9	0	194	287.4	121.7
Percent Abundance		3.31%	3.33%	1.03%	0%	6.25%	15.38%	9.96%	
Number of Taxa		3	5	3	0	5	2	4	
Subsurface Collector-Gatherer / Deposit Feeder									
Total Individuals		5	373.6	560.3	86.2	617.8	1235.6	517.2	425
Percent Abundance		21.49%	23.64%	2.47%	87.76%	39.81%	27.69%	35.6%	
Number of Taxa		6	5	6	4	3	3	1	3
Epibenthic Collector-Gatherer / Deposit Feeder									
Total Individuals		4	1163.8	1602	3340.5	43.1	1235.6	467	632.9
Percent Abundance		66.94%	67.58%	95.68%	6.12%	39.81%	25%	36.38%	
Number of Taxa		6	4	6	4	3	7	1	3
Predator / Carnivore									
Total Individuals		2	71.8	57.5	28.7	28.7	50.3	596.3	131.6
Percent Abundance		4.13%	2.42%	0.82%	4.08%	1.62%	31.92%	31.92%	12.61%
Number of Taxa		4	2	4	2	2	2	2	3
Scraper									
Total Individuals		1	28.7	71.8	0	0	28.7	0	15.9
Percent Abundance		1.65%	3.03%	0%	0%	0%	0.93%	0%	1.05%
Number of Taxa		1	1	1	0	0	2	0	1
Browser-Grazer									
Total Individuals		3	21.6	0	0	7.2	172.4	0	25.3
Percent Abundance		1.24%	0%	0%	1.02%	5.56%	0%	0%	2.16%
Number of Taxa		3	0	0	0	1	4	0	1
Scavenger (Animals)									
Total Individuals		3	21.6	0	0	7.2	172.4	0	25.3
Percent Abundance		1.24%	0%	0%	1.02%	5.56%	0%	0%	2.16%
Number of Taxa		3	0	0	0	1	4	0	1
Unspecified									
Total Individuals		0	0	0	0	0	14	0	2
Percent Abundance		0%	0%	0%	0%	0%	0.46%	0%	0.09%
Number of Taxa		0	0	0	0	0	1	0	0
Totals									
Total Individuals		18	1739	2371	3491	704	3103	1868	1379
Number of Taxa		18	18	21	12	8	21	5	13



Macroinvertebrate Results

Feeding Guild Analysis (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station # of Replicates Pooled Collection Date	BKG-BN4 3 05/21/13	Mean Values
Collector-Filterer / Suspension Feeder			
Total Individuals		229.9	121.7
Percent Abundance		13.91%	9.96%
Number of Taxa		3	4
Subsurface Collector-Gatherer / Deposit Feeder			
Total Individuals		531.6	425
Percent Abundance		32.17%	35.6%
Number of Taxa		2	3
Epibenthic Collector-Gatherer / Deposit Feeder			
Total Individuals		373.6	632.9
Percent Abundance		22.61%	36.38%
Number of Taxa		1	3
Predator / Carnivore			
Total Individuals		517.2	131.6
Percent Abundance		31.3%	12.61%
Number of Taxa		3	3
Scraper			
Total Individuals		0	15.9
Percent Abundance		0%	1.05%
Number of Taxa		0	1
Browser-Grazer			
Total Individuals		0	25.3
Percent Abundance		0%	2.16%
Number of Taxa		0	1
Scavenger (Animals)			
Total Individuals		0	25.3
Percent Abundance		0%	2.16%
Number of Taxa		0	1
Unspecified			
Total Individuals		0	2
Percent Abundance		0%	0.09%
Number of Taxa		0	0
Totals			
Total Individuals		1652	1379
Number of Taxa		8	13



Macroinvertebrate Results Feeding Guild Analysis (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T04-BN2 A 05/23/13	T04-BN2 B 05/23/13	T04-BN2 C 05/23/13	T06-BN2 A 05/23/13	T06-BN2 B 05/23/13	T06-BN2 C 05/23/13	Mean Values
Collector-Filterer / Suspension Feeder								
Total Individuals	150.9	172.4	43.1	86.2	0	129.3	121.7	
Percent Abundance	7.95%	15.38%	9.09%	9.09%	0%	15.79%	9.87%	
Number of Taxa	4	1	1	2	0	1	2	
Subsurface Collector-Gatherer / Deposit Feeder								
Total Individuals	1077.6	560.3	301.7	560.3	172.4	215.5	425	
Percent Abundance	56.82%	50%	63.64%	59.09%	36.36%	26.32%	35.41%	
Number of Taxa	2	2	3	2	2	1	2	
Epibenthic Collector-Gatherer / Deposit Feeder								
Total Individuals	21.6	0	43.1	0	0	0	632.9	
Percent Abundance	1.14%	0%	9.09%	0%	0%	0%	37.01%	
Number of Taxa	1	0	1	0	0	0	2	
Predator / Carnivore								
Total Individuals	0	43.1	0	86.2	43.1	86.2	131.6	
Percent Abundance	0%	3.85%	0%	9.09%	9.09%	10.53%	11.65%	
Number of Taxa	0	1	0	2	1	2	1	
Scraper								
Total Individuals	43.1	215.5	86.2	0	0	0	15.9	
Percent Abundance	2.27%	19.23%	18.18%	0%	0%	0%	1.26%	
Number of Taxa	1	2	2	0	0	0	0	
Browser-Grazer								
Total Individuals	280.2	64.7	0	107.8	129.3	194	25.3	
Percent Abundance	14.77%	5.77%	0%	11.36%	27.27%	23.68%	2.37%	
Number of Taxa	2	2	0	1	1	1	0	
Scavenger (Animals)								
Total Individuals	280.2	64.7	0	107.8	129.3	194	25.3	
Percent Abundance	14.77%	5.77%	0%	11.36%	27.27%	23.68%	2.37%	
Number of Taxa	2	2	0	1	1	1	0	
Unspecified								
Total Individuals	43	0	0	0	0	0	2	
Percent Abundance	2.27%	0%	0%	0%	0%	0%	0.06%	
Number of Taxa	1	0	0	0	0	0	0	
Totals								
Total Individuals	1897	1121	474	948	474	819	1379	
Number of Taxa	10	8	7	7	4	5	7	



Macroinvertebrate Results

Feeding Guild Analysis (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T08-BN2 A 05/23/13	T08-BN2 B 05/23/13	T08-BN2 C 05/23/13	T10-BN1 A 05/23/13	T10-BN1 B 05/23/13	T10-BN1 C 05/23/13	Mean Values
Collector-Filterer / Suspension Feeder								
Total Individuals	301.7	517.2	387.9	172.4	0	495.7	121.7	
Percent Abundance	17.95%	30.77%	36%	21.05%	0%	31.94%	9.87%	
Number of Taxa	4	4	3	2	0	3	2	
Subsurface Collector-Gatherer / Deposit Feeder								
Total Individuals	1034.5	991.4	431	517.2	215.5	517.2	425	
Percent Abundance	61.54%	58.97%	40%	63.16%	50%	33.33%	35.41%	
Number of Taxa	5	2	4	3	2	3	2	
Epibenthic Collector-Gatherer / Deposit Feeder								
Total Individuals	301.7	86.2	215.5	43.1	172.4	21.6	632.9	
Percent Abundance	17.95%	5.13%	20%	5.26%	40%	1.39%	37.01%	
Number of Taxa	2	1	2	1	3	1	2	
Predator / Carnivore								
Total Individuals	0	86.2	43.1	86.2	43.1	517.2	131.6	
Percent Abundance	0%	5.13%	4%	10.53%	10%	33.33%	11.65%	
Number of Taxa	0	1	1	1	1	3	1	
Scraper								
Total Individuals	43.1	0	0	0	0	0	15.9	
Percent Abundance	2.56%	0%	0%	0%	0%	0%	1.26%	
Number of Taxa	1	0	0	0	0	0	0	
Browser-Grazer								
Total Individuals	0	0	0	0	0	0	25.3	
Percent Abundance	0%	0%	0%	0%	0%	0%	2.37%	
Number of Taxa	0	0	0	0	0	0	0	
Scavenger (Animals)								
Total Individuals	0	0	0	0	0	0	25.3	
Percent Abundance	0%	0%	0%	0%	0%	0%	2.37%	
Number of Taxa	0	0	0	0	0	0	0	
Unspecified								
Total Individuals	0	0	0	0	0	0	2	
Percent Abundance	0%	0%	0%	0%	0%	0%	0.06%	
Number of Taxa	0	0	0	0	0	0	0	
Totals								
Total Individuals	1681	1681	1078	819	431	1552	1379	
Number of Taxa	12	8	10	7	6	9	7	



Macroinvertebrate Results

Feeding Guild Analysis (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T10-BN3 A 05/23/13	T10-BN3 B 05/23/13	T10-BN3 C 05/23/13	T12-BN1 A 05/23/13	T12-BN1 B 05/23/13	T12-BN1 C 05/23/13	Mean Values
Collector-Filterer / Suspension Feeder								
Total Individuals	215.5	150.9	43.1	64.7	344.8	215.5	121.7	
Percent Abundance	27.78%	43.75%	50%	15%	36.36%	8.06%	9.87%	
Number of Taxa	4	3	1	2	3	5	2	
Subsurface Collector-Gatherer / Deposit Feeder								
Total Individuals	215.5	129.3	0	43.1	301.7	948.3	425	
Percent Abundance	27.78%	37.5%	0%	10%	31.82%	35.48%	35.41%	
Number of Taxa	3	2	0	1	3	4	2	
Epibenthic Collector-Gatherer / Deposit Feeder								
Total Individuals	172.4	64.7	0	280.2	301.7	1422.4	632.9	
Percent Abundance	22.22%	18.75%	0%	65%	31.82%	53.23%	37.01%	
Number of Taxa	2	2	0	4	2	4	2	
Predator / Carnivore								
Total Individuals	172.4	0	43.1	43.1	0	86.2	131.6	
Percent Abundance	22.22%	0%	50%	10%	0%	3.23%	11.65%	
Number of Taxa	2	0	1	1	0	2	1	
Scraper								
Total Individuals	0	0	0	0	0	0	15.9	
Percent Abundance	0%	0%	0%	0%	0%	0%	1.26%	
Number of Taxa	0	0	0	0	0	0	0	
Browser-Grazer								
Total Individuals	0	0	0	0	0	0	25.3	
Percent Abundance	0%	0%	0%	0%	0%	0%	2.37%	
Number of Taxa	0	0	0	0	0	0	0	
Scavenger (Animals)								
Total Individuals	0	0	0	0	0	0	25.3	
Percent Abundance	0%	0%	0%	0%	0%	0%	2.37%	
Number of Taxa	0	0	0	0	0	0	0	
Unspecified								
Total Individuals	0	0	0	0	0	0	2	
Percent Abundance	0%	0%	0%	0%	0%	0%	0.06%	
Number of Taxa	0	0	0	0	0	0	0	
Totals								
Total Individuals	776	345	86	431	948	2672	1379	
Number of Taxa	11	6	2	7	8	13	7	



Macroinvertebrate Results

Feeding Guild Analysis (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T12-BN3 A 05/23/13	T12-BN3 B 05/23/13	T12-BN3 C 05/23/13	T14-BN1 A 05/23/13	T14-BN1 B 05/23/13	T14-BN1 C 05/23/13	Mean Values
Collector-Filterer / Suspension Feeder								
Total Individuals	86.2	43.1	86.2	0	129.3	172.4	121.7	
Percent Abundance	13.33%	14.29%	7.69%	0%	7.14%	10.81%	9.87%	
Number of Taxa	2	1	2	0	3	4	2	
Subsurface Collector-Gatherer / Deposit Feeder								
Total Individuals	215.5	129.3	43.1	172.4	646.6	732.8	425	
Percent Abundance	33.33%	42.86%	3.85%	57.14%	35.71%	45.95%	35.41%	
Number of Taxa	2	2	1	2	2	5	2	
Epibenthic Collector-Gatherer / Deposit Feeder								
Total Individuals	86.2	86.2	603.4	129.3	431	560.3	632.9	
Percent Abundance	13.33%	28.57%	53.85%	42.86%	23.81%	35.14%	37.01%	
Number of Taxa	2	1	2	2	4	5	2	
Predator / Carnivore								
Total Individuals	258.6	43.1	387.9	0	517.2	43.1	131.6	
Percent Abundance	40%	14.29%	34.62%	0%	28.57%	2.7%	11.65%	
Number of Taxa	1	1	2	0	4	1	1	
Scraper								
Total Individuals	0	0	0	0	43.1	86.2	15.9	
Percent Abundance	0%	0%	0%	0%	2.38%	5.41%	1.26%	
Number of Taxa	0	0	0	0	1	2	0	
Browser-Grazer								
Total Individuals	0	0	0	0	21.6	0	25.3	
Percent Abundance	0%	0%	0%	0%	1.19%	0%	2.37%	
Number of Taxa	0	0	0	0	1	0	0	
Scavenger (Animals)								
Total Individuals	0	0	0	0	21.6	0	25.3	
Percent Abundance	0%	0%	0%	0%	1.19%	0%	2.37%	
Number of Taxa	0	0	0	0	1	0	0	
Unspecified								
Total Individuals	0	0	0	0	0	0	2	
Percent Abundance	0%	0%	0%	0%	0%	0%	0.06%	
Number of Taxa	0	0	0	0	0	0	0	
Totals								
Total Individuals	647	302	1121	302	1810	1595	1379	
Number of Taxa	7	5	7	4	14	16	7	



Macroinvertebrate Results

Feeding Guild Analysis (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T14-BN3 A 05/23/13	T14-BN3 B 05/23/13	T14-BN3 C 05/23/13	T16-BN1 A 05/23/13	T16-BN1 B 05/23/13	T16-BN1 C 05/23/13	Mean Values
Collector-Filterer / Suspension Feeder								
Total Individuals	0	0	0	43.1	43.1	43.1	121.7	
Percent Abundance	0%	0%	0%	7.69%	2.04%	7.69%	9.87%	
Number of Taxa	0	0	0	1	1	1	2	
Subsurface Collector-Gatherer / Deposit Feeder								
Total Individuals	215.5	86.2	86.2	43.1	474.1	215.5	425	
Percent Abundance	62.5%	28.57%	66.67%	7.69%	22.45%	38.46%	35.41%	
Number of Taxa	3	2	2	1	3	2	2	
Epibenthic Collector-Gatherer / Deposit Feeder								
Total Individuals	43.1	215.5	43.1	474.1	1250	258.6	632.9	
Percent Abundance	12.5%	71.43%	33.33%	84.62%	59.18%	46.15%	37.01%	
Number of Taxa	1	2	1	2	2	1	2	
Predator / Carnivore								
Total Individuals	86.2	0	0	0	344.8	43.1	131.6	
Percent Abundance	25%	0%	0%	0%	16.33%	7.69%	11.65%	
Number of Taxa	2	0	0	0	2	1	1	
Scraper								
Total Individuals	0	0	0	0	0	0	15.9	
Percent Abundance	0%	0%	0%	0%	0%	0%	1.26%	
Number of Taxa	0	0	0	0	0	0	0	
Browser-Grazer								
Total Individuals	0	0	0	0	0	0	25.3	
Percent Abundance	0%	0%	0%	0%	0%	0%	2.37%	
Number of Taxa	0	0	0	0	0	0	0	
Scavenger (Animals)								
Total Individuals	0	0	0	0	0	0	25.3	
Percent Abundance	0%	0%	0%	0%	0%	0%	2.37%	
Number of Taxa	0	0	0	0	0	0	0	
Unspecified								
Total Individuals	0	0	0	0	0	0	2	
Percent Abundance	0%	0%	0%	0%	0%	0%	0.06%	
Number of Taxa	0	0	0	0	0	0	0	
Totals								
Total Individuals	345	302	129	560	2112	560	1379	
Number of Taxa	6	4	3	4	7	5	7	



Macroinvertebrate Results

Feeding Guild Analysis (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T16-BN3 A 05/23/13	T16-BN3 B 05/23/13	T16-BN3 C 05/23/13	T18-BN1 A 05/23/13	T18-BN1 B 05/23/13	T18-BN1 C 05/23/13	Mean Values
Collector-Filterer / Suspension Feeder								
Total Individuals	0	0	0	64.7	43.1	43.1	121.7	
Percent Abundance	0%	0%	0%	3.06%	3.23%	2.56%	9.87%	
Number of Taxa	0	0	0	2	1	1	2	
Subsurface Collector-Gatherer / Deposit Feeder								
Total Individuals	43.1	172.4	0	517.2	172.4	258.6	425	
Percent Abundance	16.67%	50%	0%	24.49%	12.9%	15.38%	35.41%	
Number of Taxa	1	1	0	3	1	2	2	
Epibenthic Collector-Gatherer / Deposit Feeder								
Total Individuals	129.3	43.1	43.1	1400.9	1077.6	1379.3	632.9	
Percent Abundance	50%	12.5%	50%	66.33%	80.65%	82.05%	37.01%	
Number of Taxa	1	1	1	5	3	3	2	
Predator / Carnivore								
Total Individuals	86.2	129.3	0	86.2	43.1	0	131.6	
Percent Abundance	33.33%	37.5%	0%	4.08%	3.23%	0%	11.65%	
Number of Taxa	1	2	0	2	1	0	1	
Scraper								
Total Individuals	0	0	0	0	0	0	15.9	
Percent Abundance	0%	0%	0%	0%	0%	0%	1.26%	
Number of Taxa	0	0	0	0	0	0	0	
Browser-Grazer								
Total Individuals	0	0	21.6	21.6	0	0	25.3	
Percent Abundance	0%	0%	25%	1.02%	0%	0%	2.37%	
Number of Taxa	0	0	1	1	0	0	0	
Scavenger (Animals)								
Total Individuals	0	0	21.6	21.6	0	0	25.3	
Percent Abundance	0%	0%	25%	1.02%	0%	0%	2.37%	
Number of Taxa	0	0	1	1	0	0	0	
Unspecified								
Total Individuals	0	0	0	0	0	0	2	
Percent Abundance	0%	0%	0%	0%	0%	0%	0.06%	
Number of Taxa	0	0	0	0	0	0	0	
Totals								
Total Individuals	259	345	86	2112	1336	1681	1379	
Number of Taxa	3	4	2	12	6	6	7	



Macroinvertebrate Results

Feeding Guild Analysis (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T18-BN3 A 05/23/13	T18-BN3 B 05/23/13	T18-BN3 C 05/23/13	T20-BN1 A 05/23/13	T20-BN1 B 05/23/13	T20-BN1 C 05/23/13	Mean Values
Collector-Filterer / Suspension Feeder								
Total Individuals	86.2	0	86.2	107.8	43.1	86.2	121.7	
Percent Abundance	3.85%	0%	3.92%	3.33%	1.64%	6.9%	9.87%	
Number of Taxa	2	0	2	3	1	2	2	
Subsurface Collector-Gatherer / Deposit Feeder								
Total Individuals	732.8	43.1	344.8	1293.1	129.3	258.6	425	
Percent Abundance	32.69%	5.56%	15.69%	40%	4.92%	20.69%	35.41%	
Number of Taxa	4	1	3	4	2	4	2	
Epibenthic Collector-Gatherer / Deposit Feeder								
Total Individuals	1163.8	689.7	1637.9	1745.7	2284.5	775.9	632.9	
Percent Abundance	51.92%	88.89%	74.51%	54%	86.89%	62.07%	37.01%	
Number of Taxa	2	3	2	5	4	5	2	
Predator / Carnivore								
Total Individuals	172.4	0	43.1	86.2	43.1	43.1	131.6	
Percent Abundance	7.69%	0%	1.96%	2.67%	1.64%	3.45%	11.65%	
Number of Taxa	2	0	1	2	1	1	1	
Scraper								
Total Individuals	0	43.1	43.1	0	129.3	86.2	15.9	
Percent Abundance	0%	5.56%	1.96%	0%	4.92%	6.9%	1.26%	
Number of Taxa	0	1	1	0	1	1	0	
Browser-Grazer								
Total Individuals	43.1	0	21.6	0	0	0	25.3	
Percent Abundance	1.92%	0%	0.98%	0%	0%	0%	2.37%	
Number of Taxa	2	0	1	0	0	0	0	
Scavenger (Animals)								
Total Individuals	43.1	0	21.6	0	0	0	25.3	
Percent Abundance	1.92%	0%	0.98%	0%	0%	0%	2.37%	
Number of Taxa	2	0	1	0	0	0	0	
Unspecified								
Total Individuals	0	0	0	0	0	0	2	
Percent Abundance	0%	0%	0%	0%	0%	0%	0.06%	
Number of Taxa	0	0	0	0	0	0	0	
Totals								
Total Individuals	2241	776	2198	3233	2629	1250	1379	
Number of Taxa	12	5	10	13	9	12	7	



Macroinvertebrate Results

Feeding Guild Analysis (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T20-BN3 A 05/23/13	T20-BN3 B 05/23/13	T20-BN3 C 05/23/13	BKG-BN1 A 05/23/13	BKG-BN1 B 05/23/13	BKG-BN1 C 05/23/13	Mean Values
Collector-Filterer / Suspension Feeder								
Total Individuals	43.1	0	64.7	0	0	0	0	121.7
Percent Abundance	1.52%	0%	2.21%	0%	0%	0%	0%	9.87%
Number of Taxa	1	0	2	0	0	0	0	2
Subsurface Collector-Gatherer / Deposit Feeder								
Total Individuals	129.3	0	129.3	258.6	603.4	991.4	425	
Percent Abundance	4.55%	0%	4.41%	75%	93.33%	88.46%	35.41%	
Number of Taxa	2	0	2	1	3	1	1	2
Epibenthic Collector-Gatherer / Deposit Feeder								
Total Individuals	2586.2	4698.3	2737.1	0	43.1	86.2	632.9	
Percent Abundance	90.91%	100%	93.38%	0%	6.67%	7.69%	37.01%	
Number of Taxa	3	3	4	0	1	2	2	
Predator / Carnivore								
Total Individuals	86.2	0	0	43.1	0	43.1	131.6	
Percent Abundance	3.03%	0%	0%	12.5%	0%	3.85%	11.65%	
Number of Taxa	2	0	0	1	0	1	1	
Scraper								
Total Individuals	0	0	0	0	0	0	15.9	
Percent Abundance	0%	0%	0%	0%	0%	0%	1.26%	
Number of Taxa	0	0	0	0	0	0	0	
Browser-Grazer								
Total Individuals	0	0	0	21.6	0	0	25.3	
Percent Abundance	0%	0%	0%	6.25%	0%	0%	2.37%	
Number of Taxa	0	0	0	1	0	0	0	
Scavenger (Animals)								
Total Individuals	0	0	0	21.6	0	0	25.3	
Percent Abundance	0%	0%	0%	6.25%	0%	0%	2.37%	
Number of Taxa	0	0	0	1	0	0	0	
Unspecified								
Total Individuals	0	0	0	0	0	0	2	
Percent Abundance	0%	0%	0%	0%	0%	0%	0.06%	
Number of Taxa	0	0	0	0	0	0	0	
Totals								
Total Individuals	2845	4698	2931	345	647	1121	1379	
Number of Taxa	8	3	7	3	4	3	7	



Macroinvertebrate Results

Feeding Guild Analysis (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	BKG-BN2 A 05/23/13	BKG-BN2 B 05/23/13	BKG-BN2 C 05/23/13	BKG-BN3 A 05/21/13	BKG-BN3 B 05/21/13	BKG-BN3 C 05/21/13	Mean Values
Collector-Filterer / Suspension Feeder								
Total Individuals	129.3	64.7	387.9	129.3	86.2	646.6	121.7	
Percent Abundance	5.45%	3.13%	7.96%	12%	8.33%	18.52%	9.87%	
Number of Taxa	2	2	3	1	1	2	2	
Subsurface Collector-Gatherer / Deposit Feeder								
Total Individuals	1077.6	775.9	1853.4	517.2	258.6	775.9	425	
Percent Abundance	45.45%	37.5%	38.05%	48%	25%	22.22%	35.41%	
Number of Taxa	2	2	2	1	1	1	2	
Epibenthic Collector-Gatherer / Deposit Feeder								
Total Individuals	862.1	948.3	1896.6	194	258.6	948.3	632.9	
Percent Abundance	36.36%	45.83%	38.94%	18%	25%	27.16%	37.01%	
Number of Taxa	3	6	4	1	1	1	2	
Predator / Carnivore								
Total Individuals	43.1	64.7	43.1	237.1	431	1120.7	131.6	
Percent Abundance	1.82%	3.13%	0.88%	22%	41.67%	32.1%	11.65%	
Number of Taxa	1	2	1	2	2	2	1	
Scraper								
Total Individuals	43.1	0	43.1	0	0	0	15.9	
Percent Abundance	1.82%	0%	0.88%	0%	0%	0%	1.26%	
Number of Taxa	1	0	1	0	0	0	0	
Browser-Grazer								
Total Individuals	107.8	107.8	301.7	0	0	0	25.3	
Percent Abundance	4.55%	5.21%	6.19%	0%	0%	0%	2.37%	
Number of Taxa	2	1	3	0	0	0	0	
Scavenger (Animals)								
Total Individuals	107.8	107.8	301.7	0	0	0	25.3	
Percent Abundance	4.55%	5.21%	6.19%	0%	0%	0%	2.37%	
Number of Taxa	2	1	3	0	0	0	0	
Unspecified								
Total Individuals	0	0	43	0	0	0	2	
Percent Abundance	0%	0%	0.88%	0%	0%	0%	0.06%	
Number of Taxa	0	0	1	0	0	0	0	
Totals								
Total Individuals	2371	2069	4871	1078	1034	3491	1379	
Number of Taxa	10	11	14	4	4	5	7	



Macroinvertebrate Results

Feeding Guild Analysis (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	BKG-BN4 A 05/21/13	BKG-BN4 B 05/21/13	BKG-BN4 C 05/21/13	Mean Values
Collector-Filterer / Suspension Feeder					
Total Individuals	215.5	0	474.1	121.7	
Percent Abundance	11.63%	0%	16.67%	9.87%	
Number of Taxa	3	0	3	2	
Subsurface Collector-Gatherer / Deposit Feeder					
Total Individuals	474.1	129.3	991.4	425	
Percent Abundance	25.58%	50%	34.85%	35.41%	
Number of Taxa	1	2	1	2	
Epibenthic Collector-Gatherer / Deposit Feeder					
Total Individuals	495.7	43.1	581.9	632.9	
Percent Abundance	26.74%	16.67%	20.45%	37.01%	
Number of Taxa	1	1	1	2	
Predator / Carnivore					
Total Individuals	668.1	86.2	797.4	131.6	
Percent Abundance	36.05%	33.33%	28.03%	11.65%	
Number of Taxa	2	2	2	1	
Scraper					
Total Individuals	0	0	0	15.9	
Percent Abundance	0%	0%	0%	1.26%	
Number of Taxa	0	0	0	0	
Browser-Grazer					
Total Individuals	0	0	0	25.3	
Percent Abundance	0%	0%	0%	2.37%	
Number of Taxa	0	0	0	0	
Scavenger (Animals)					
Total Individuals	0	0	0	25.3	
Percent Abundance	0%	0%	0%	2.37%	
Number of Taxa	0	0	0	0	
Unspecified					
Total Individuals	0	0	0	2	
Percent Abundance	0%	0%	0%	0.06%	
Number of Taxa	0	0	0	0	
Totals					
Total Individuals	1853	259	2845	1379	
Number of Taxa	6	4	6	7	



Macroinvertebrate Results

Percent Occurrence (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T04-BN2 3 05/23/13	T06-BN2 3 05/23/13	T08-BN2 3 05/23/13	T10-BN1 3 05/23/13	T10-BN3 3 05/23/13	T12-BN1 3 05/23/13
Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified							
Actiniaria (LPIL)		0%	5.77%	0%	7.69%	14.29%	1.06%
Class: Unspecified							
Order: Unspecified							
Family: Unspecified							
Cnidaria (LPIL)		0%	0%	0%	0%	0%	0%
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		0%	0%	0%	0%	0%	0%
<i>Capitella</i> sp.		44.44%	38.46%	37.86%	4.62%	0%	0%
<i>Capitellidae</i> (LPIL)		0%	0%	0%	0%	0%	0%
<i>Mediomastus californiensis</i>		0%	0%	0%	0%	0%	0%
<i>Mediomastus</i> sp.		0%	0%	0%	0%	0%	6.38%
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>		0%	0%	0%	0%	0%	0%
Order: Eunicida							
Family: Dorvilleidae							
<i>Dorvilleidae</i> (LPIL)		0%	0%	0%	0%	0%	0%
<i>Ophryotrocha</i> sp.		0%	0%	0%	0%	0%	0%
<i>Schistomerings rudolphii</i>		0%	0%	0%	3.08%	0%	0%
<i>Schistomerings</i> sp.		0%	0%	0%	0%	0%	0%
Family: Lumbrineridae							
<i>Scoletoma</i> sp.		0%	0%	0%	0%	0%	0%
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.		0%	0%	0%	0%	0%	0%
<i>Scoloplos texana</i>		0%	0%	2.91%	0%	0%	0%
Family: Paraonidae							
<i>Cirrophorus furcatus</i>		6.17%	0%	2.91%	23.08%	3.57%	14.89%
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>		0%	0%	0%	0%	0%	0%
<i>Glycera</i> sp.		0%	0%	0.97%	0%	0%	0%
Family: Hesionidae							
<i>Hesionidae</i> (LPIL)		0%	0%	0%	0%	0%	0%
<i>Parahesione</i> sp.		0%	1.92%	0%	12.31%	3.57%	2.13%
<i>Podarkeopsis levifuscina</i>		0%	0%	0%	0%	0%	0%
Family: Nereididae							
<i>Nereididae</i> (LPIL)		0%	0%	0%	0%	0%	0%
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>		0%	0%	0%	0%	0%	0%



Macroinvertebrate Results

Percent Occurrence (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T04-BN2 3 05/23/13	T06-BN2 3 05/23/13	T08-BN2 3 05/23/13	T10-BN1 3 05/23/13	T10-BN3 3 05/23/13	T12-BN1 3 05/23/13
<i>Sigambra tentaculata</i>		0%	0%	0%	0%	0%	0%
Family: Syllidae							
<i>Sphaerosyllis</i> sp.		0%	0%	0%	0%	0%	0%
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>		0%	0%	0%	0%	0%	0%
Sabellidae (LPIL)		0%	0%	0%	0%	0%	0%
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>		1.23%	0%	0%	0%	0%	1.06%
Magelonidae (LPIL)		0%	0%	0%	0%	0%	0%
Family: Spionidae							
<i>Minuspio</i> sp.		0%	0%	0%	0%	0%	1.06%
<i>Parapriionospio alata</i>		0%	0%	0%	0%	0%	0%
<i>Prionospio cristata</i>		0%	0%	0%	0%	0%	0%
<i>Prionospio</i> sp.		0%	0%	0%	0%	0%	1.06%
<i>Pseudopolydora</i> sp.		1.23%	0%	0%	0%	0%	0%
Spionidae (LPIL)		0%	0%	0%	1.54%	3.57%	1.06%
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.		0%	0%	9.71%	1.54%	7.14%	41.49%
<i>Caulieriella</i> sp.		0%	0%	0%	0%	0%	1.06%
Cirratulidae (LPIL)		0%	0%	3.88%	4.62%	10.71%	4.26%
<i>Cirriformia</i> sp.		0%	0%	0%	0%	0%	0%
<i>Cirriformia</i> sp. B Vittor		0%	0%	0%	0%	0%	0%
<i>Monticellina</i> sp.		0%	0%	0%	1.54%	0%	0%
Family: Sternaspidae							
<i>Sternaspis</i> sp.		0%	0%	2.91%	0%	3.57%	0%
Class: Clitellata							
Order: Haplotaxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>		0%	0%	0%	0%	0%	0%
Tubificoid Naididae (LPIL)		4.94%	3.85%	8.74%	16.92%	17.86%	8.51%
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
<i>Aoridae</i> (LPIL)		0%	0%	0%	0%	0%	0%
<i>Grandidierella bonnieroides</i>		1.23%	0%	0%	0%	0%	0%
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.		0%	0%	0%	0%	0%	0%
Family: Palaemonidae							
<i>Palaemonidae</i> (LPIL)		0%	0%	0%	0%	0%	0%
Family: Penaeidae							
<i>Lucifer</i> sp.		0%	0%	0%	0%	0%	0%
Penaeidae (LPIL)		0%	0%	0%	0%	0%	0%



Macroinvertebrate Results

Percent Occurrence (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T04-BN2 3 05/23/13	T06-BN2 3 05/23/13	T08-BN2 3 05/23/13	T10-BN1 3 05/23/13	T10-BN3 3 05/23/13	T12-BN1 3 05/23/13
Family: Upogebiidae							
<i>Upogebia affinis</i>		0%	1.92%	0%	0%	0%	0%
<i>Upogebia</i> sp.		0%	0%	0%	0%	0%	1.06%
Family: Unspecified							
Decapoda (LPIL) zoea larva		17.28%	38.46%	0%	0%	0%	0%
Decapoda (LPIL) megalopa larva		1.23%	0%	0%	0%	0%	0%
Order: Mysida							
Family: Mysidae							
<i>Bowmaniella dissimilis</i>		0%	0%	0%	0%	0%	0%
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae							
<i>Haminoea elegans</i>		1.23%	0%	0%	0%	0%	0%
<i>Haminoea</i> sp.		1.23%	0%	0%	0%	0%	0%
Order: Cycloneritimorpha							
Family: Neritidae							
<i>Neritidae</i> (LPIL)		1.23%	0%	0%	0%	0%	0%
Order: Neogastropoda							
Family: Muricidae							
<i>Urosalpinx cinerea</i>		1.23%	1.92%	1.94%	0%	0%	0%
Family: Olividae							
<i>Olivella olssoni</i>		0%	0%	0%	0%	0%	0%
<i>Olivella perplexa</i>		3.7%	0%	0.97%	0%	0%	0%
Order: Neotaenioglossa							
Family: Caecidae							
<i>Caecum pulchellum</i>		0%	0%	0%	0%	3.57%	2.13%
Family: Calyptaeidae							
<i>Crepidula fornicata</i>		0%	0%	0%	0%	0%	0%
Family: Neritidae							
<i>Neritina virginea</i>		3.7%	0%	0%	0%	0%	0%
Order: Unspecified							
Family: Cylichnidae							
<i>Cylichnella bidentata</i>		0%	0%	0%	0%	0%	0%
Family: Unspecified							
Gastropoda (LPIL)		0%	0%	0%	0%	0%	0%
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae							
<i>Arcopsis adamsi</i>		0%	0%	0%	0%	0%	0%
Order: Nuculoida							
Family: Nuculanidae							
<i>Nuculana cocentrica</i>		0%	0%	4.85%	0%	3.57%	0%
Order: Veneroida							
Family: Corbulidae							
<i>Caryocorbula caribaea</i>		1.23%	0%	0%	0%	0%	0%
<i>Caryocorbula</i> sp.		0%	0%	0%	0%	0%	0%



Macroinvertebrate Results

Percent Occurrence (Pooled)

Prepared For: CH2M HILL
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 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T04-BN2 3 05/23/13	T06-BN2 3 05/23/13	T08-BN2 3 05/23/13	T10-BN1 3 05/23/13	T10-BN3 3 05/23/13	T12-BN1 3 05/23/13
Family: Solecurtidae							
<i>Tagelus divisus</i>		0%	1.92%	4.85%	1.54%	0%	0%
<i>Tagelus</i> sp.		1.23%	0%	0%	0%	7.14%	1.06%
Family: Tellinidae							
<i>Angulus versicolor</i>		0%	0%	0%	0%	0%	0%
<i>Macoma cerina</i>		6.17%	5.77%	8.74%	12.31%	0%	7.45%
<i>Macoma</i> sp.		0%	0%	7.77%	9.23%	10.71%	4.26%
<i>Merisca</i> sp.		1.23%	0%	0%	0%	0%	0%
Tellinidae (LPIL)		0%	0%	0%	0%	7.14%	0%
Family: Veneridae							
<i>Anomalocardia cuneimeris</i>		0%	0%	0.97%	0%	0%	0%
<i>Chione cancellata</i>		0%	0%	0%	0%	0%	0%
<i>Chione</i> sp		0%	0%	0%	0%	3.57%	0%
Order: Unspecified							
Family: Unspecified							
Bivalvia (LPIL)		0%	0%	0%	0%	0%	0%
Total Percentage		99.93%	99.99%	99.98%	100.02%	99.98%	99.98%
Number of Taxa		18	9	15	13	14	17



Macroinvertebrate Results

Percent Occurrence (Pooled)

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 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T12-BN3 3 05/23/13	T14-BN1 3 05/23/13	T14-BN3 3 05/23/13	T16-BN1 3 05/23/13	T16-BN3 3 05/23/13	T18-BN1 3 05/23/13
Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified							
Actiniaria (LPIL)		0%	0%	5.56%	1.33%	6.25%	0.84%
Class: Unspecified							
Order: Unspecified							
Family: Unspecified							
Cnidaria (LPIL)		2.08%	0%	0%	0%	0%	0%
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		0%	0%	0%	0%	0%	0%
<i>Capitella</i> sp.		0%	5.81%	11.11%	0%	0%	0%
Capitellidae (LPIL)		0%	0%	0%	1.33%	0%	0%
<i>Mediomastus californiensis</i>		0%	0%	0%	0%	0%	0%
<i>Mediomastus</i> sp.		0%	2.33%	0%	0%	0%	0%
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>		0%	0%	0%	0%	0%	0%
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)		2.08%	0%	0%	0%	0%	0%
<i>Ophryotrocha</i> sp.		0%	0%	0%	0%	0%	0%
<i>Schistomerings rudolphii</i>		0%	0%	0%	0%	0%	0%
<i>Schistomerings</i> sp.		0%	1.16%	0%	0%	0%	0%
Family: Lumbrineridae							
<i>Scoletoma</i> sp.		0%	1.16%	0%	0%	0%	0%
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.		0%	0%	0%	0%	0%	0%
<i>Scoloplos texana</i>		0%	0%	0%	0%	0%	0%
Family: Paraonidae							
<i>Cirrophorus furcatus</i>		10.42%	13.95%	22.22%	17.33%	31.25%	7.56%
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>		0%	1.16%	0%	0%	0%	0.84%
<i>Glycera</i> sp.		2.08%	0%	0%	0%	0%	0%
Family: Hesionidae							
Hesionidae (LPIL)		0%	1.16%	0%	0%	0%	0%
<i>Parahesione</i> sp.		29.17%	10.47%	0%	8%	25%	0.84%
<i>Podarkeopsis levifuscina</i>		0%	0%	0%	2.67%	0%	0%
Family: Nereididae							
Nereididae (LPIL)		0%	0%	0%	0%	0%	0%
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>		0%	0%	0%	0%	0%	0%



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Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T12-BN3 3 05/23/13	T14-BN1 3 05/23/13	T14-BN3 3 05/23/13	T16-BN1 3 05/23/13	T16-BN3 3 05/23/13	T18-BN1 3 05/23/13
<i>Sigambra tentaculata</i>		0%	0%	0%	0%	0%	0%
Family: Syllidae							
<i>Sphaerosyllis</i> sp.		0%	0%	0%	0%	0%	0%
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>		0%	0%	0%	0%	0%	0%
Sabellidae (LPIL)		0%	0%	0%	0%	0%	0%
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>		0%	2.33%	0%	0%	0%	0%
Magelonidae (LPIL)		0%	0%	0%	0%	0%	0%
Family: Spionidae							
<i>Minuspio</i> sp.		0%	0%	0%	0%	0%	0.84%
<i>Parapriionospio alata</i>		0%	0%	0%	0%	0%	0%
<i>Prionospio cristata</i>		0%	0%	0%	0%	0%	0%
<i>Prionospio</i> sp.		0%	2.33%	0%	0%	0%	0%
<i>Pseudopolydora</i> sp.		0%	0%	0%	0%	0%	0%
Spionidae (LPIL)		0%	2.33%	0%	2.67%	0%	0%
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.		20.83%	6.98%	0%	0%	0%	33.61%
<i>Cauilleriella</i> sp.		0%	2.33%	0%	1.33%	0%	5.04%
Cirratulidae (LPIL)		16.67%	16.28%	0%	58.67%	31.25%	33.61%
<i>Cirriformia</i> sp.		0%	0%	22.22%	0%	0%	0%
<i>Cirriformia</i> sp. B Vittor		0%	0%	0%	0%	0%	0%
<i>Monticellina</i> sp.		0%	0%	16.67%	0%	0%	2.52%
Family: Sternaspidae							
<i>Sternaspis</i> sp.		0%	0%	0%	0%	0%	3.36%
Class: Clitellata							
Order: Haplotaxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>		0%	0%	0%	0%	0%	0%
Tubificoid Naididae (LPIL)		8.33%	18.6%	16.67%	4%	0%	7.56%
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
<i>Aoridae</i> (LPIL)		0%	0%	0%	0%	0%	0%
<i>Grandidierella bonnieroides</i>		0%	0%	0%	0%	0%	0%
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.		0%	1.16%	0%	0%	0%	0%
Family: Palaemonidae							
<i>Palaemonidae</i> (LPIL)		0%	0%	0%	0%	0%	0.84%
Family: Penaeidae							
<i>Lucifer</i> sp.		0%	0%	0%	0%	0%	0%
Penaeidae (LPIL)		0%	0%	0%	0%	0%	0%



Macroinvertebrate Results

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 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T12-BN3 3 05/23/13	T14-BN1 3 05/23/13	T14-BN3 3 05/23/13	T16-BN1 3 05/23/13	T16-BN3 3 05/23/13	T18-BN1 3 05/23/13
Family: Upogebiidae							
<i>Upogebia affinis</i>		0%	0%	0%	0%	0%	0%
<i>Upogebia</i> sp.		0%	1.16%	0%	0%	0%	0.84%
Family: Unspecified							
Decapoda (LPIL) zoea larva		0%	0%	0%	0%	6.25%	0%
Decapoda (LPIL) megalopa larva		0%	0%	0%	0%	0%	0%
Order: Mysida							
Family: Mysidae							
<i>Bowmaniella dissimilis</i>		0%	0%	0%	1.33%	0%	0%
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae							
<i>Haminoea elegans</i>		0%	0%	0%	0%	0%	0%
<i>Haminoea</i> sp.		0%	0%	0%	0%	0%	0%
Order: Cycloneritimorpha							
Family: Neritidae							
<i>Neritidae</i> (LPIL)		0%	0%	0%	0%	0%	0%
Order: Neogastropoda							
Family: Muricidae							
<i>Urosalpinx cinerea</i>		0%	0%	5.56%	0%	0%	0%
Family: Olividae							
<i>Olivella olssoni</i>		0%	0%	0%	0%	0%	0%
<i>Olivella perplexa</i>		0%	1.16%	0%	0%	0%	0%
Order: Neotaenioglossa							
Family: Caecidae							
<i>Caecum pulchellum</i>		0%	1.16%	0%	0%	0%	0%
Family: Calyptaeidae							
<i>Crepidula fornicata</i>		0%	1.16%	0%	0%	0%	0%
Family: Neritidae							
<i>Neritina virginea</i>		0%	2.33%	0%	0%	0%	0%
Order: Unspecified							
Family: Cylichnidae							
<i>Cylichnella bidentata</i>		0%	0%	0%	0%	0%	0%
Family: Unspecified							
Gastropoda (LPIL)		0%	0%	0%	0%	0%	0%
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae							
<i>Arcopsis adamsi</i>		0%	0%	0%	0%	0%	0.84%
Order: Nuculoida							
Family: Nuculanidae							
<i>Nuculana cocentrica</i>		2.08%	0%	0%	0%	0%	0%
Order: Veneroida							
Family: Corbulidae							
<i>Caryocorbula caribaea</i>		0%	1.16%	0%	1.33%	0%	0.84%
		0%	0%	0%	0%	0%	0%



Macroinvertebrate Results

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Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T12-BN3 3 05/23/13	T14-BN1 3 05/23/13	T14-BN3 3 05/23/13	T16-BN1 3 05/23/13	T16-BN3 3 05/23/13	T18-BN1 3 05/23/13
Family: Solecurtidae							
<i>Tagelus divisus</i>		0%	0%	0%	0%	0%	0%
<i>Tagelus</i> sp.	2.08%	0%	0%	0%	0%	0%	0%
Family: Tellinidae							
<i>Angulus versicolor</i>		0%	0%	0%	0%	0%	0%
<i>Macoma cerina</i>		0%	1.16%	0%	0%	0%	0%
<i>Macoma</i> sp.	2.08%	0%	0%	0%	0%	0%	0%
<i>Merisca</i> sp.		0%	0%	0%	0%	0%	0%
Tellinidae (LPIL)	2.08%	0%	0%	0%	0%	0%	0%
Family: Veneridae							
<i>Anomalocardia cuneimeris</i>		0%	0%	0%	0%	0%	0%
<i>Chione cancellata</i>		0%	1.16%	0%	0%	0%	0%
<i>Chione</i> sp	0%	0%	0%	0%	0%	0%	0%
Order: Unspecified							
Family: Unspecified							
Bivalvia (LPIL)		0%	0%	0%	0%	0%	0%
Total Percentage	99.98%	99.99%	100.01%	99.99%	100%	99.98%	
Number of Taxa	12	24	7	11	5	15	



Macroinvertebrate Results

Percent Occurrence (Pooled)

Prepared For: CH2M HILL
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Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T18-BN3 3 05/23/13	T20-BN1 3 05/23/13	T20-BN3 3 05/23/13	BKG-BN1 3 05/23/13	BKG-BN2 3 05/23/13	BKG-BN3 3 05/21/13
Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified							
Actiniaria (LPIL)		0%	0%	0%	0%	0%	0%
Class: Unspecified							
Order: Unspecified							
Family: Unspecified							
Cnidaria (LPIL)		0%	0%	0%	0%	0%	0%
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		0%	0%	0%	2.04%	0.46%	0%
<i>Capitella</i> sp.		0%	1.82%	0%	0%	1.85%	0%
Capitellidae (LPIL)		0%	0%	0%	0%	0%	0%
<i>Mediomastus californiensis</i>		0.83%	0%	0%	0%	0%	0%
<i>Mediomastus</i> sp.		0%	1.21%	0%	0%	0%	0%
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>		4.13%	0%	0%	0%	0%	0%
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)		0%	0%	0.41%	0%	0%	6.92%
<i>Ophryotrocha</i> sp.		0%	0%	0%	0%	0%	0%
<i>Schistomerings rudolphii</i>		0%	0%	0%	0%	0%	0%
<i>Schistomerings</i> sp.		0%	0%	0%	0%	0%	0%
Family: Lumbrineridae							
<i>Scoletoma</i> sp.		0.83%	0%	0%	2.04%	1.39%	0%
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.		0%	1.82%	0.41%	0%	0%	0%
<i>Scoloplos texana</i>		1.65%	0%	0.82%	0%	0%	0%
Family: Paraonidae							
<i>Cirrophorus furcatus</i>		11.57%	16.36%	0.82%	0%	0%	0%
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>		0%	0.61%	0%	0%	0%	0%
<i>Glycera</i> sp.		0%	0%	0%	0%	0%	0%
Family: Hesionidae							
Hesionidae (LPIL)		0%	0%	0%	0%	0%	0%
<i>Parahesione</i> sp.		3.31%	0%	0%	0%	0%	0%
<i>Podarkeopsis levifuscina</i>		0%	0%	0%	0%	0%	0%
Family: Nereididae							
Nereididae (LPIL)		0%	0%	0%	4.08%	0.46%	0%
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>		0%	0.61%	0%	0%	0%	0%



Macroinvertebrate Results

Percent Occurrence (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T18-BN3 3 05/23/13	T20-BN1 3 05/23/13	T20-BN3 3 05/23/13	BKG-BN1 3 05/23/13	BKG-BN2 3 05/23/13	BKG-BN3 3 05/21/13
<i>Sigambra tentaculata</i>		0%	0.61%	0%	0%	0%	0%
Family: Syllidae		0%	0%	0%	0%	0%	50%
<i>Sphaerosyllis</i> sp.		0%	0%	0%	0%	0%	50%
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>		0%	0.61%	0%	0%	0%	0%
Sabellidae (LPIL)		0%	0.61%	0%	0%	0%	0%
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>		0%	6.06%	5.35%	0%	0.46%	0%
Magelonidae (LPIL)	0.83%	0%	0%	0%	0%	0%	0%
Family: Spionidae							
<i>Minuspio</i> sp.		0%	0%	0%	0%	0%	0%
<i>Parapriionospio alata</i>		0%	0%	0.41%	0%	0%	0%
<i>Prionospio cristata</i>		0%	0%	0%	0%	6.48%	0%
<i>Prionospio</i> sp.		0%	0%	0%	0%	2.31%	0%
<i>Pseudopolydora</i> sp.		0%	0%	0%	0%	0%	0%
Spionidae (LPIL)		0%	1.82%	0%	0%	0%	0%
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.		28.1%	30.91%	76.54%	0%	18.06%	0%
<i>Caulieriella</i> sp.		0.83%	1.21%	0%	2.04%	2.31%	0%
Cirratulidae (LPIL)	37.19%	27.88%	13.58%	2.04%	14.35%	0%	
<i>Cirriformia</i> sp.		0%	0%	0%	0%	0%	0%
<i>Cirriformia</i> sp. B Vittor		0%	0.61%	0%	0%	0%	0%
<i>Monticellina</i> sp.		0%	0%	0%	0%	0%	0%
Family: Sternaspidae							
<i>Sternaspis</i> sp.		0%	0.61%	0%	0%	0%	0%
Class: Clitellata							
Order: Haplotaxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>		0%	0%	0%	2.04%	0%	0%
Tubificoid Naididae (LPIL)	3.31%	1.82%	0.41%	83.67%	37.5%	27.69%	
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
<i>Aoridae</i> (LPIL)		0.83%	0%	0%	0%	0.46%	0%
<i>Grandidierella bonnieroides</i>		0%	0%	0%	0%	0%	0%
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.		0%	0%	0%	0%	0%	0%
Family: Palaemonidae							
<i>Palaemonidae</i> (LPIL)		0%	0%	0%	0%	0%	0%
Family: Penaeidae							
<i>Lucifer</i> sp.		0%	0%	0%	0%	0.46%	0%
Penaeidae (LPIL)		0.83%	0%	0%	0%	0.46%	0%



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Percent Occurrence (Pooled)

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Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T18-BN3 3 05/23/13	T20-BN1 3 05/23/13	T20-BN3 3 05/23/13	BKG-BN1 3 05/23/13	BKG-BN2 3 05/23/13	BKG-BN3 3 05/21/13
Family: Upogebiidae							
<i>Upogebia affinis</i>		1.65%	0%	0%	0%	0%	0%
<i>Upogebia</i> sp.		0.83%	0.61%	0%	0%	0%	0%
Family: Unspecified							
Decapoda (LPIL) zoea larva		0.83%	0%	0%	2.04%	9.72%	0%
Decapoda (LPIL) megalopa larva		0%	0%	0%	0%	0%	0%
Order: Mysida							
Family: Mysidae							
<i>Bowmaniella dissimilis</i>		0%	0%	0%	0%	0%	0%
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae							
<i>Haminoea elegans</i>		1.65%	0%	0%	0%	0%	0%
<i>Haminoea</i> sp.		0%	0%	0%	0%	0%	0%
Order: Cycloneritimorpha							
Family: Neritidae							
<i>Neritidae</i> (LPIL)		0%	0%	0%	0%	0%	0%
Order: Neogastropoda							
Family: Muricidae							
<i>Urosalpinx cinerea</i>		0%	0.61%	0.41%	0%	0%	0%
Family: Olividae							
<i>Olivella olssoni</i>		0%	0%	0%	0%	0.46%	0%
<i>Olivella perplexa</i>		0%	3.03%	0%	0%	0%	0%
Order: Neotaenioglossa							
Family: Caecidae							
<i>Caecum pulchellum</i>		0%	0%	0%	0%	0%	0%
Family: Calyptaeidae							
<i>Crepidula fornicata</i>		0%	0%	0%	0%	0%	0%
Family: Neritidae							
<i>Neritina virginea</i>		0%	0%	0%	0%	0%	0%
Order: Unspecified							
Family: Cylichnidae							
<i>Cylichnella bidentata</i>		0%	0%	0%	0%	0.46%	0%
Family: Unspecified							
Gastropoda (LPIL)		0%	0%	0%	0%	0.46%	0%
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae							
<i>Arcopsis adamsi</i>		0%	0%	0%	0%	0%	0%
Order: Nuculoida							
Family: Nuculanidae							
<i>Nuculana cocentrica</i>		0.83%	0.61%	0%	0%	0.93%	0%
Order: Veneroida							
Family: Corbulidae							
<i>Caryocorbula caribaea</i>		0%	0%	0%	0%	0%	0%
		0%	0%	0.41%	0%	0%	0%



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Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T18-BN3 3 05/23/13	T20-BN1 3 05/23/13	T20-BN3 3 05/23/13	BKG-BN1 3 05/23/13	BKG-BN2 3 05/23/13	BKG-BN3 3 05/21/13
Family: Solecurtidae							
<i>Tagelus divisus</i>		0%	0%	0%	0%	0%	0%
<i>Tagelus</i> sp.		0%	0%	0%	0%	0%	0%
Family: Tellinidae							
<i>Angulus versicolor</i>		0%	0%	0%	0%	0.46%	0%
<i>Macoma cerina</i>		0%	0%	0%	0%	0.46%	3.85%
<i>Macoma</i> sp.		0%	0%	0%	0%	0%	0%
<i>Merisca</i> sp.		0%	0%	0%	0%	0%	0%
Tellinidae (LPIL)		0%	0%	0%	0%	0%	0%
Family: Veneridae							
<i>Anomalocardia cuneimeris</i>		0%	0%	0%	0%	0%	0%
<i>Chione cancellata</i>		0%	0%	0.41%	0%	0%	0%
<i>Chione</i> sp		0%	0%	0%	0%	0%	0%
Order: Unspecified							
Family: Unspecified							
Bivalvia (LPIL)		0%	0%	0%	0%	0%	11.54%
Total Percentage		100.03%	100.04%	99.98%	99.99%	99.96%	100%
Number of Taxa		18	21	12	8	21	5



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Taxonomic Classification	Station Number of Replicates Pooled Collection Date	
Phylum: Cnidaria		BKG-BN4
Class: Anthozoa		3
Order: Actiniaria		05/21/13
Family: Unspecified		
Actiniaria (LPIL)		0%
Class: Unspecified		
Order: Unspecified		
Family: Unspecified		
Cnidaria (LPIL)		0%
Phylum: Annelida		
Class: Polychaeta		
Order: Capitellida		
Family: Capitellidae		
<i>Capitella capitata</i> complex Blake		0%
<i>Capitella</i> sp.		0%
Capitellidae (LPIL)		0%
<i>Mediomastus californiensis</i>		0%
<i>Mediomastus</i> sp.		0%
Order: Cossurida		
Family: Cossuridae		
<i>Cossura delta</i>		0%
Order: Eunicida		
Family: Dorvilleidae		
Dorvilleidae (LPIL)		4.35%
<i>Ophryotrocha</i> sp.		4.35%
<i>Schistomerings rudolphii</i>		0%
<i>Schistomerings</i> sp.		0%
Family: Lumbrineridae		
<i>Scoletoma</i> sp.		0%
Order: Orbiniida		
Family: Orbiniidae		
<i>Scoloplos</i> sp.		0%
<i>Scoloplos texana</i>		0%
Family: Paraonidae		
<i>Cirrophorus furcatus</i>		0.87%
Order: Phyllodocida		
Family: Glyceridae		
<i>Glycera brevicirris</i>		0%
<i>Glycera</i> sp.		0%
Family: Hesionidae		
Hesionidae (LPIL)		0%
<i>Parahesione</i> sp.		0%
<i>Podarkeopsis levifuscina</i>		0%
Family: Nereididae		
Nereididae (LPIL)		0%
Family: Pilargidae		
<i>Ancistrosyllis jonesi</i>		0%



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Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	
	BKG-BN4 3 05/21/13	
<i>Sigambra tentaculata</i>		0%
Family: Syllidae		
<i>Sphaerosyllis</i> sp.		45.22%
Order: Sabellida		
Family: Sabellidae		
<i>Bispira melanostigma</i>		0%
Sabellidae (LPIL)		0%
Order: Spionida		
Family: Magelonidae		
<i>Magelona pettiboneae</i>		0%
Magelonidae (LPIL)		0%
Family: Spionidae		
<i>Minuspio</i> sp.		0%
<i>Parapriionospio alata</i>		0%
<i>Prionospio cristata</i>		0%
<i>Prionospio</i> sp.		0%
<i>Pseudopolydora</i> sp.		0%
Spionidae (LPIL)		0%
Order: Terebellida		
Family: Cirratulidae		
<i>Aphelochaeta</i> sp.		0%
<i>Cauilleriella</i> sp.		0%
Cirratulidae (LPIL)		0%
<i>Cirriformia</i> sp.		0%
<i>Cirriformia</i> sp. B Vittor		0%
<i>Monticellina</i> sp.		0%
Family: Sternaspidae		
<i>Sternaspis</i> sp.		0%
Class: Clitellata		
Order: Haplotauxida		
Family: Tubificoid Naididae		
<i>Tectidrilus squalidus</i>		0%
Tubificoid Naididae (LPIL)		31.3%
Phylum: Arthropoda		
Class: Malacostraca		
Order: Amphipoda		
Family: Aoridae		
Aoridae (LPIL)		0%
<i>Grandidierella bonnieroides</i>		0%
Order: Decapoda		
Family: Alpheidae		
<i>Alpheus</i> sp.		0%
Family: Palaemonidae		
Palaemonidae (LPIL)		0%
Family: Penaeidae		
<i>Lucifer</i> sp.		0%
Penaeidae (LPIL)		0%



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Sample Method: Petite Ponar
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Taxonomic Classification	Station Number of Replicates Pooled Collection Date	
	BKG-BN4 3 05/21/13	
Family: Upogebiidae <i>Upogebia affinis</i> <i>Upogebia</i> sp.		0% 0%
Family: Unspecified Decapoda (LPIL) zoea larva Decapoda (LPIL) megalopa larva		0% 0%
Order: Mysida		
Family: Mysidae <i>Bowmaniella dissimilis</i>		0%
Phylum: Mollusca		
Class: Gastropoda		
Order: Cephalaspidea		
Family: Haminoeidae <i>Haminoea elegans</i> <i>Haminoea</i> sp.		0% 0%
Order: Cycloneritimorpha		
Family: Neritidae Neritidae (LPIL)		0%
Order: Neogastropoda		
Family: Muricidae <i>Urosalpinx cinerea</i>		0%
Family: Olividae <i>Olivella olssoni</i> <i>Olivella perplexa</i>		0% 0%
Order: Neotaenioglossa		
Family: Caecidae <i>Caecum pulchellum</i>		0%
Family: Calyptaeidae <i>Crepidula fornicata</i>		0%
Family: Neritidae <i>Neritina virginea</i>		0%
Order: Unspecified		
Family: Cylichnidae <i>Cylichnella bidentata</i>		0%
Family: Unspecified Gastropoda (LPIL)		0%
Class: Bivalvia		
Order: Arcoida		
Family: Noetiidae <i>Arcopsis adamsi</i>		0%
Order: Nuculoida		
Family: Nuculanidae <i>Nuculana cocentrica</i>		0%
Order: Veneroida		
Family: Corbulidae <i>Caryocorbula caribaea</i> <i>Caryocorbula</i> sp.		0% 0%



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Taxonomic Classification	Station Number of Replicates Pooled Collection Date	
Family: Solecurtidae		
<i>Tagelus divisus</i>		0%
<i>Tagelus</i> sp.		0%
Family: Tellinidae		
<i>Angulus versicolor</i>		0%
<i>Macoma cerina</i>		2.61%
<i>Macoma</i> sp.		0%
<i>Merisca</i> sp.		0%
Tellinidae (LPIL)		1.74%
Family: Veneridae		
<i>Anomalocardia cuneimeris</i>		0%
<i>Chione cancellata</i>		0%
<i>Chione</i> sp		0%
Order: Unspecified		
Family: Unspecified		
Bivalvia (LPIL)		9.57%
Total Percentage		100.01%
Number of Taxa		8



Macroinvertebrate Results

Raw Data Report (Pooled)

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Sample Method: Petite Ponar
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Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T04-BN2 3 05/23/13	T06-BN2 3 05/23/13	T08-BN2 3 05/23/13	T10-BN1 3 05/23/13	T10-BN3 3 05/23/13	T12-BN1 3 05/23/13
Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified							
Actiniaria (LPIL)	-	6	-		10	8	2
Class: Unspecified							
Order: Unspecified							
Family: Unspecified							
Cnidaria (LPIL)	-	-	-	-	-	-	-
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake	-	-	-	-	-	-	-
<i>Capitella</i> sp.	72	40	78	6	-	-	-
Capitellidae (LPIL)	-	-	-	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-	-	-	12
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>	-	-	-	-	-	-	-
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)	-	-	-	-	-	-	-
<i>Ophryotrocha</i> sp.	-	-	-	-	-	-	-
<i>Schistomeringos rudolphi</i>	-	-	-	-	4	-	-
<i>Schistomeringos</i> sp.	-	-	-	-	-	-	-
Family: Lumbrineridae							
<i>Scoletoma</i> sp.	-	-	-	-	-	-	-
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.	-	-	-	-	-	-	-
<i>Scoloplos texana</i>	-	-	6	-	-	-	-
Family: Paraonidae							
<i>Cirrophorus furcatus</i>	10	-	6	30	2	28	
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>	-	-	-	-	-	-	-
<i>Glycera</i> sp.	-	-	2	-	-	-	-
Family: Hesionidae							
Hesionidae (LPIL)	-	-	-	-	-	-	-
<i>Parahesione</i> sp.	-	2	-	16	2	4	
<i>Podarkeopsis levifuscina</i>	-	-	-	-	-	-	-
Family: Nereididae							
Nereididae (LPIL)	-	-	-	-	-	-	-
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>	-	-	-	-	-	-	-



Macroinvertebrate Results

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<i>Sigambra tentaculata</i>	-	-	-	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	-
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	-
<i>Sabellidae</i> (LPIL)	-	-	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	2	-	-	-	-	-	2
<i>Magelonidae</i> (LPIL)	-	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	2
<i>Parapriionospio alata</i>	-	-	-	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	-	-	-
<i>Prionospio</i> sp.	-	-	-	-	-	-	2
<i>Pseudopolydora</i> sp.	2	-	-	-	-	-	-
<i>Spionidae</i> (LPIL)	-	-	-	-	2	2	2
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	-	-	20	2	4	78	
<i>Caulieriella</i> sp.	-	-	-	-	-	-	2
<i>Cirratulidae</i> (LPIL)	-	-	8	6	6	8	
<i>Cirriformia</i> sp.	-	-	-	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	-
<i>Monticellina</i> sp.	-	-	-	2	-	-	-
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	-	6	-	2	-	-
Class: Clitellata							
Order: Haplotauxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	-	-
<i>Tubificoid Naididae</i> (LPIL)	8	4	18	22	10	16	
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
<i>Aoridae</i> (LPIL)	-	-	-	-	-	-	-
<i>Grandidierella bonnierooides</i>	2	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	-	-
Family: Palaemonidae							
<i>Palaemonidae</i> (LPIL)	-	-	-	-	-	-	-
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	-	-	-
<i>Penaeidae</i> (LPIL)	-	-	-	-	-	-	-



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Family: Upogebiidae							
<i>Upogebia affinis</i>	-	2	-	-	-	-	-
<i>Upogebia</i> sp.	-	-	-	-	-	-	2
Family: Unspecified							
Decapoda (LPIL) zoea larva	28	40	-	-	-	-	-
Decapoda (LPIL) megalopa larva	2	-	-	-	-	-	-
Order: Mysida							
Family: Mysidae							
<i>Bowmaniella dissimilis</i>	-	-	-	-	-	-	-
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae							
<i>Haminoea elegans</i>	2	-	-	-	-	-	-
<i>Haminoea</i> sp.	2	-	-	-	-	-	-
Order: Cycloneritimorpha							
Family: Neritidae							
<i>Neritidae</i> (LPIL)	2	-	-	-	-	-	-
Order: Neogastropoda							
Family: Muricidae							
<i>Urosalpinx cinerea</i>	2	2	4	-	-	-	-
Family: Olividae							
<i>Olivella olssoni</i>	-	-	-	-	-	-	-
<i>Olivella perplexa</i>	6	-	2	-	-	-	-
Order: Neotaenioglossa							
Family: Caecidae							
<i>Caecum pulchellum</i>	-	-	-	-	-	2	4
Family: Calyptraeidae							
<i>Crepidula fornicata</i>	-	-	-	-	-	-	-
Family: Neritidae							
<i>Neritina virginea</i>	6	-	-	-	-	-	-
Order: Unspecified							
Family: Cylichnidae							
<i>Cylichnella bidentata</i>	-	-	-	-	-	-	-
Family: Unspecified							
Gastropoda (LPIL)	-	-	-	-	-	-	-
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae							
<i>Arcopsis adamsi</i>	-	-	-	-	-	-	-
Order: Nuculoida							
Family: Nuculanidae							
<i>Nuculana cocentrica</i>	-	-	10	-	-	2	-
Order: Veneroida							
Family: Corbulidae							
<i>Caryocorbula caribaea</i>	2	-	-	-	-	-	-
<i>Caryocorbula</i> sp.	-	-	-	-	-	-	-



Macroinvertebrate Results

Raw Data Report (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T04-BN2 3 05/23/13	T06-BN2 3 05/23/13	T08-BN2 3 05/23/13	T10-BN1 3 05/23/13	T10-BN3 3 05/23/13	T12-BN1 3 05/23/13
Family: Solecurtidae							
<i>Tagelus divisus</i>	-	2		10	2	-	-
<i>Tagelus</i> sp.	2	-		-	-	4	2
Family: Tellinidae							
<i>Angulus versicolor</i>	-	-		-	-	-	-
<i>Macoma cerina</i>	10	6	18	16	-	-	14
<i>Macoma</i> sp.	-	-	16	12	6	8	
<i>Merisca</i> sp.	2	-	-	-	-	-	-
Tellinidae (LPIL)	-	-	-	-	-	4	-
Family: Veneridae							
<i>Anomalocardia cuneimeris</i>	-	-	2	-	-	-	-
<i>Chione cancellata</i>	-	-	-	-	-	-	-
<i>Chione</i> sp	-	-	-	-	-	2	-
Order: Unspecified							
Family: Unspecified							
Bivalvia (LPIL)	-	-	-	-	-	-	-
Total Organisms	81	52	103	65	28	94	
Total Taxa	18	9	15	13	14	17	



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Report Date: 07/25/2013



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Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
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Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T12-BN3 3 05/23/13	T14-BN1 3 05/23/13	T14-BN3 3 05/23/13	T16-BN1 3 05/23/13	T16-BN3 3 05/23/13	T18-BN1 3 05/23/13
<i>Sigambra tentaculata</i>	-	-	-	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	-
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	-
<i>Sabellidae</i> (LPIL)	-	-	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	-	4	-	-	-	-	-
<i>Magelonidae</i> (LPIL)	-	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	2
<i>Parapriionospio alata</i>	-	-	-	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	-	-	-
<i>Prionospio</i> sp.	-	4	-	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-	-	-	-
<i>Spionidae</i> (LPIL)	-	4	-	4	-	-	-
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	20	12	-	-	-	-	80
<i>Caulieriella</i> sp.	-	4	-	2	-	-	12
<i>Cirratulidae</i> (LPIL)	16	28	-	88	10	-	80
<i>Cirriformia</i> sp.	-	-	8	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	-
<i>Monticellina</i> sp.	-	-	6	-	-	-	6
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	-	-	-	-	-	8
Class: Clitellata							
Order: Haplotauxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	-	-
<i>Tubificoid Naididae</i> (LPIL)	8	32	6	6	-	-	18
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
<i>Aoridae</i> (LPIL)	-	-	-	-	-	-	-
<i>Grandidierella bonnierooides</i>	-	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	2	-	-	-	-	-
Family: Palaemonidae							
<i>Palaemonidae</i> (LPIL)	-	-	-	-	-	-	2
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	-	-	-
<i>Penaeidae</i> (LPIL)	-	-	-	-	-	-	-



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Sample Method: Petite Ponar
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Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T12-BN3 3 05/23/13	T14-BN1 3 05/23/13	T14-BN3 3 05/23/13	T16-BN1 3 05/23/13	T16-BN3 3 05/23/13	T18-BN1 3 05/23/13
Family: Upogebiidae		-	-	-	-	-	-
<i>Upogebia affinis</i>		-	-	-	-	-	-
<i>Upogebia</i> sp.		-	2	-	-	-	2
Family: Unspecified		-	-	-	-	2	-
Decapoda (LPIL) zoea larva		-	-	-	-	2	-
Decapoda (LPIL) megalopa larva		-	-	-	-	-	-
Order: Mysida		-	-	-	2	-	-
Family: Mysidae		-	-	-	2	-	-
<i>Bowmaniella dissimilis</i>		-	-	-	2	-	-
Phylum: Mollusca		-	-	-	2	-	-
Class: Gastropoda		-	-	-	2	-	-
Order: Cephalaspidea		-	-	-	-	-	-
Family: Haminoeidae		-	-	-	-	-	-
<i>Haminoea elegans</i>		-	-	-	-	-	-
<i>Haminoea</i> sp.		-	-	-	-	-	-
Order: Cycloneritimorpha		-	-	-	-	-	-
Family: Neritidae		-	-	-	-	-	-
<i>Neritidae</i> (LPIL)		-	-	-	-	-	-
Order: Neogastropoda		-	-	2	-	-	-
Family: Muricidae		-	-	2	-	-	-
<i>Urosalpinx cinerea</i>		-	-	2	-	-	-
Family: Olividae		-	-	-	-	-	-
<i>Olivella olssoni</i>		-	-	-	-	-	-
<i>Olivella perplexa</i>		-	2	-	-	-	-
Order: Neotaenioglossa		-	-	-	-	-	-
Family: Caecidae		-	2	-	-	-	-
<i>Caecum pulchellum</i>		-	2	-	-	-	-
Family: Calyptraeidae		-	2	-	-	-	-
<i>Crepidula fornicate</i>		-	2	-	-	-	-
Family: Neritidae		-	4	-	-	-	-
<i>Neritina virginea</i>		-	4	-	-	-	-
Order: Unspecified		-	-	-	-	-	-
Family: Cylichnidae		-	-	-	-	-	-
<i>Cylichnella bidentata</i>		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Gastropoda (LPIL)		-	-	-	-	-	-
Class: Bivalvia		-	-	-	-	-	-
Order: Arcoida		-	-	-	-	-	-
Family: Noetiidae		-	-	-	-	-	2
<i>Arcopsis adamsi</i>		-	-	-	-	-	2
Order: Nuculoida		-	-	-	-	-	-
Family: Nuculanidae		2	-	-	-	-	-
<i>Nuculana cocentrica</i>		2	-	-	-	-	-
Order: Veneroida		-	2	-	2	-	2
Family: Corbulidae		-	2	-	2	-	2
<i>Caryocorbula caribaea</i>		-	2	-	2	-	2
<i>Caryocorbula</i> sp.		-	-	-	-	-	-



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Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
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 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T12-BN3 3 05/23/13	T14-BN1 3 05/23/13	T14-BN3 3 05/23/13	T16-BN1 3 05/23/13	T16-BN3 3 05/23/13	T18-BN1 3 05/23/13
Family: Solecurtidae		-	-	-	-	-	-
<i>Tagelus divisus</i>		-	-	-	-	-	-
<i>Tagelus</i> sp.	2	-	-	-	-	-	-
Family: Tellinidae		-	-	-	-	-	-
<i>Angulus versicolor</i>	-	-	-	-	-	-	-
<i>Macoma cerina</i>	-	2	-	-	-	-	-
<i>Macoma</i> sp.	2	-	-	-	-	-	-
<i>Merisca</i> sp.	-	-	-	-	-	-	-
Tellinidae (LPIL)	2	-	-	-	-	-	-
Family: Veneridae		-	-	-	-	-	-
<i>Anomalocardia cuneimeris</i>	-	-	-	-	-	-	-
<i>Chione cancellata</i>	-	2	-	-	-	-	-
<i>Chione</i> sp	-	-	-	-	-	-	-
Order: Unspecified		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Bivalvia (LPIL)	-	-	-	-	-	-	-
Total Organisms	48	86	18	75	16	119	
Total Taxa	12	24	7	11	5	15	



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 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T18-BN3 3 05/23/13	T20-BN1 3 05/23/13	T20-BN3 3 05/23/13	BKG-BN1 3 05/23/13	BKG-BN2 3 05/23/13	BKG-BN3 3 05/21/13
<i>Sigambra tentaculata</i>	-		2	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	130
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	2	-	-	-	-	-
<i>Sabellidae</i> (LPIL)	-	2	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	-	20	26	-	2	-	-
<i>Magelonidae</i> (LPIL)	2	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	-
<i>Parapriionospio alata</i>	-	-	2	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	28	-	-
<i>Prionospio</i> sp.	-	-	-	-	10	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-	-	-	-
<i>Spionidae</i> (LPIL)	-	6	-	-	-	-	-
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	68	102	372	-	78	-	-
<i>Caulieriella</i> sp.	2	4	-	2	10	-	-
<i>Cirratulidae</i> (LPIL)	90	92	66	2	62	-	-
<i>Cirriformia</i> sp.	-	-	-	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	2	-	-	-	-	-
<i>Monticellina</i> sp.	-	-	-	-	-	-	-
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	2	-	-	-	-	-
Class: Clitellata							
Order: Haplotauxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	2	-	-	-
<i>Tubificoid Naididae</i> (LPIL)	8	6	2	82	162	72	-
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
<i>Aoridae</i> (LPIL)	2	-	-	-	2	-	-
<i>Grandidierella bonnieroides</i>	-	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	-	-
Family: Palaemonidae							
<i>Palaemonidae</i> (LPIL)	-	-	-	-	-	-	-
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	2	-	-
<i>Penaeidae</i> (LPIL)	2	-	-	-	2	-	-



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Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T18-BN3 3 05/23/13	T20-BN1 3 05/23/13	T20-BN3 3 05/23/13	BKG-BN1 3 05/23/13	BKG-BN2 3 05/23/13	BKG-BN3 3 05/21/13
Family: Upogebiidae							
<i>Upogebia affinis</i>	4	-	-	-	-	-	-
<i>Upogebia</i> sp.	2	2	-	-	-	-	-
Family: Unspecified							
Decapoda (LPIL) zoea larva	2	-	-	2	42	-	-
Decapoda (LPIL) megalopa larva	-	-	-	-	-	-	-
Order: Mysida							
Family: Mysidae							
<i>Bowmaniella dissimilis</i>	-	-	-	-	-	-	-
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae							
<i>Haminoea elegans</i>	4	-	-	-	-	-	-
<i>Haminoea</i> sp.	-	-	-	-	-	-	-
Order: Cycloneritimorpha							
Family: Neritidae							
<i>Neritidae</i> (LPIL)	-	-	-	-	-	-	-
Order: Neogastropoda							
Family: Muricidae							
<i>Urosalpinx cinerea</i>	-	2	2	-	-	-	-
Family: Olividae							
<i>Olivella olssoni</i>	-	-	-	-	2	-	-
<i>Olivella perplexa</i>	-	10	-	-	-	-	-
Order: Neotaenioglossa							
Family: Caecidae							
<i>Caecum pulchellum</i>	-	-	-	-	-	-	-
Family: Calyptraeidae							
<i>Crepidula fornicata</i>	-	-	-	-	-	-	-
Family: Neritidae							
<i>Neritina virginea</i>	-	-	-	-	-	-	-
Order: Unspecified							
Family: Cylichnidae							
<i>Cylichnella bidentata</i>	-	-	-	-	-	2	-
Family: Unspecified							
Gastropoda (LPIL)	-	-	-	-	-	2	-
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae							
<i>Arcopsis adamsi</i>	-	-	-	-	-	-	-
Order: Nuculoida							
Family: Nuculanidae							
<i>Nuculana cocentrica</i>	2	2	-	-	-	4	-
Order: Veneroida							
Family: Corbulidae							
<i>Caryocorbula caribaea</i>	-	-	-	-	-	-	-
<i>Caryocorbula</i> sp.	-	-	2	-	-	-	-



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Taxonomic Classification	Station Number of Replicates Pooled Collection Date	T18-BN3 3 05/23/13	T20-BN1 3 05/23/13	T20-BN3 3 05/23/13	BKG-BN1 3 05/23/13	BKG-BN2 3 05/23/13	BKG-BN3 3 05/21/13
Family: Solecurtidae		-	-	-	-	-	-
<i>Tagelus divisus</i>		-	-	-	-	-	-
<i>Tagelus</i> sp.		-	-	-	-	-	-
Family: Tellinidae		-	-	-	-	2	-
<i>Angulus versicolor</i>		-	-	-	-	2	-
<i>Macoma cerina</i>		-	-	-	-	2	10
<i>Macoma</i> sp.		-	-	-	-	-	-
<i>Merisca</i> sp.		-	-	-	-	-	-
Tellinidae (LPIL)		-	-	-	-	-	-
Family: Veneridae		-	-	-	-	-	-
<i>Anomalocardia cuneimeris</i>		-	-	-	-	-	-
<i>Chione cancellata</i>		-	-	2	-	-	-
<i>Chione</i> sp		-	-	-	-	-	-
Order: Unspecified		-	-	-	-	-	30
Family: Unspecified		-	-	-	-	-	130
Bivalvia (LPIL)		121	165	243	49	216	130
Total Organisms		18	21	12	8	21	5
Total Taxa							



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 Canal Benthic Community

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Taxonomic Classification	Station Number of Replicates Pooled Collection Date	
	BKG-BN4 3 05/21/13	-
<i>Sigambra tentaculata</i>		-
Family: Syllidae		104
<i>Sphaerosyllis</i> sp.		-
Order: Sabellida		-
Family: Sabellidae		-
<i>Bispira melanostigma</i>		-
<i>Sabellidae</i> (LPIL)		-
Order: Spionida		-
Family: Magelonidae		-
<i>Magelona pettiboneae</i>		-
<i>Magelonidae</i> (LPIL)		-
Family: Spionidae		-
<i>Minuspio</i> sp.		-
<i>Parapriionospio alata</i>		-
<i>Prionospio cristata</i>		-
<i>Prionospio</i> sp.		-
<i>Pseudopolydora</i> sp.		-
<i>Spionidae</i> (LPIL)		-
Order: Terebellida		-
Family: Cirratulidae		-
<i>Aphelochaeta</i> sp.		-
<i>Caulieriella</i> sp.		-
<i>Cirratulidae</i> (LPIL)		-
<i>Cirriformia</i> sp.		-
<i>Cirriformia</i> sp. B Vittor		-
<i>Monticellina</i> sp.		-
Family: Sternaspidae		-
<i>Sternaspis</i> sp.		-
Class: Clitellata		-
Order: Haplotauxida		-
Family: Tubificoid Naididae		72
<i>Tectidrilus squalidus</i>		-
<i>Tubificoid Naididae</i> (LPIL)		-
Phylum: Arthropoda		-
Class: Malacostraca		-
Order: Amphipoda		-
Family: Aoridae		-
<i>Aoridae</i> (LPIL)		-
<i>Grandidierella bonnieroides</i>		-
Order: Decapoda		-
Family: Alpheidae		-
<i>Alpheus</i> sp.		-
Family: Palaemonidae		-
<i>Palaemonidae</i> (LPIL)		-
Family: Penaeidae		-
<i>Lucifer</i> sp.		-
<i>Penaeidae</i> (LPIL)		-



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Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled Collection Date	
	BKG-BN4 3 05/21/13	
Family: Upogebiidae <i>Upogebia affinis</i> <i>Upogebia</i> sp.		-
Family: Unspecified Decapoda (LPIL) zoea larva Decapoda (LPIL) megalopa larva		-
Order: Mysida		
Family: Mysidae <i>Bowmaniella dissimilis</i>		-
Phylum: Mollusca		
Class: Gastropoda		
Order: Cephalaspidea		
Family: Haminoeidae <i>Haminoea elegans</i> <i>Haminoea</i> sp.		-
Order: Cycloneritimorpha		
Family: Neritidae Neritidae (LPIL)		-
Order: Neogastropoda		
Family: Muricidae <i>Urosalpinx cinerea</i>		-
Family: Olividae <i>Olivella olssoni</i> <i>Olivella perplexa</i>		-
Order: Neotaenioglossa		
Family: Caecidae <i>Caecum pulchellum</i>		-
Family: Calyptraeidae <i>Crepidula fornicate</i>		-
Family: Neritidae <i>Neritina virginea</i>		-
Order: Unspecified		
Family: Cylichnidae <i>Cylichnella bidentata</i>		-
Family: Unspecified Gastropoda (LPIL)		-
Class: Bivalvia		
Order: Arcoida		
Family: Noetiidae <i>Arcopsis adamsi</i>		-
Order: Nuculoida		
Family: Nuculanidae <i>Nuculana cocentrica</i>		-
Order: Veneroida		
Family: Corbulidae <i>Caryocorbula caribaea</i> <i>Caryocorbula</i> sp.		-



Macroinvertebrate Results

Raw Data Report (Pooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Number of Replicates Pooled	Collection Date	
	BKG-BN4		
Family: Solecurtidae	3		
<i>Tagelus divisus</i>	-		
<i>Tagelus sp.</i>	-		
Family: Tellinidae			
<i>Angulus versicolor</i>	-		
<i>Macoma cerina</i>	6		
<i>Macoma sp.</i>	-		
<i>Merisca sp.</i>	-		
Tellinidae (LPIL)	4		
Family: Veneridae			
<i>Anomalocardia cuneimeris</i>	-		
<i>Chione cancellata</i>	-		
<i>Chione sp</i>	-		
Order: Unspecified			
Family: Unspecified			
Bivalvia (LPIL)	22		
Total Organisms	115		
Total Taxa	8		



Macroinvertebrate Results

Raw Data Report (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T04-BN2 A 05/23/13	T04-BN2 B 05/23/13	T04-BN2 C 05/23/13	T06-BN2 A 05/23/13	T06-BN2 B 05/23/13	T06-BN2 C 05/23/13
Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified		-	-	-	2	2	2
Actiniaria (LPIL)							
Class: Unspecified							
Order: Unspecified							
Family: Unspecified		-	-	-	-	-	-
Cnidaria (LPIL)							
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		-	-	-	-	-	-
<i>Capitella</i> sp.	44	18	10	24	6	10	
Capitellidae (LPIL)		-	-	-	-	-	
<i>Mediomastus californiensis</i>		-	-	-	-	-	
<i>Mediomastus</i> sp.	-	-	-	-	-	-	
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>		-	-	-	-	-	
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)		-	-	-	-	-	
<i>Ophryotrocha</i> sp.		-	-	-	-	-	
<i>Schistomeringos rudolphii</i>		-	-	-	-	-	
<i>Schistomeringos</i> sp.		-	-	-	-	-	
Family: Lumbrineridae							
<i>Scoletoma</i> sp.		-	-	-	-	-	
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.		-	-	-	-	-	
<i>Scoloplos texana</i>		-	-	-	-	-	
Family: Paraonidae							
<i>Cirrophorus furcatus</i>		-	8	2	-	-	
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>		-	-	-	-	-	
<i>Glycera</i> sp.		-	-	-	-	-	
Family: Hesionidae							
Hesionidae (LPIL)		-	-	-	-	-	
<i>Parahesione</i> sp.		-	-	-	2	-	
<i>Podarkeopsis levifuscina</i>		-	-	-	-	-	
Family: Nereididae							
Nereididae (LPIL)		-	-	-	-	-	
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>		-	-	-	-	-	



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Macroinvertebrate Results Raw Data Report (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
Canal Benthic Community
Assessment
Sample Group: PTPLLC Cooling Water
Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T04-BN2 A 05/23/13	T04-BN2 B 05/23/13	T04-BN2 C 05/23/13	T06-BN2 A 05/23/13	T06-BN2 B 05/23/13	T06-BN2 C 05/23/13
<i>Sigambra tentaculata</i>	-	-	-	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	-
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	-
Sabellidae (LPIL)	-	-	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	-	-	-	2	-	-	-
Magelonidae (LPIL)	-	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	-
<i>Parapriionospio alata</i>	-	-	-	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	-	-	-
<i>Prionospio</i> sp.	-	-	-	-	-	-	-
<i>Pseudopolydora</i> sp.	2	-	-	-	-	-	-
Spionidae (LPIL)	-	-	-	-	-	-	-
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	-	-	-	-	-	-	-
<i>Caulieriella</i> sp.	-	-	-	-	-	-	-
Cirratulidae (LPIL)	-	-	-	-	-	-	-
<i>Cirriformia</i> sp.	-	-	-	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	-
<i>Monticellina</i> sp.	-	-	-	-	-	-	-
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	-	-	-	-	-	-
Class: Clitellata							
Order: Haplotaxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	-	-
Tubificoid Naididae (LPIL)	6	-	2	2	2	-	-
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
Aoridae (LPIL)	-	-	-	-	-	-	-
<i>Grandidierella bonnieroides</i>	2	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	-	-
Family: Palaemonidae							
Palaemonidae (LPIL)	-	-	-	-	-	-	-
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	-	-	-
Penaeidae (LPIL)	-	-	-	-	-	-	-



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Family: Upogebiidae <i>Upogebia affinis</i> <i>Upogebia</i> sp.		-	-	-	2	-	-
Family: Unspecified Decapoda (LPIL) zoea larva Decapoda (LPIL) megalopa larva	24	4	-	-	10	12	18
Order: Mysida	-	2	-	-	-	-	-
Family: Mysidae <i>Bowmaniella dissimilis</i>		-	-	-	-	-	-
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae <i>Haminoea elegans</i> <i>Haminoea</i> sp.		-	-	2	-	-	-
Order: Cycloneritimorpha				2	-	-	-
Family: Neritidae Neritidae (LPIL)	2	-	-	-	-	-	-
Order: Neogastropoda							
Family: Muricidae <i>Urosalpinx cinerea</i>		-	2	-	-	-	2
Family: Olividae <i>Olivella olssoni</i> <i>Olivella perplexa</i>	2	4	-	-	-	-	-
Order: Neotaenioglossa							
Family: Caecidae <i>Caecum pulchellum</i>		-	-	-	-	-	-
Family: Calyptaeidae <i>Crepidula fornicate</i>		-	-	-	-	-	-
Family: Neritidae <i>Neritina virginea</i>		-	6	-	-	-	-
Order: Unspecified							
Family: Cylichnidae <i>Cylichnella bidentata</i>		-	-	-	-	-	-
Family: Unspecified Gastropoda (LPIL)		-	-	-	-	-	-
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae <i>Arcopsis adamsi</i>		-	-	-	-	-	-
Order: Nuculoida							
Family: Nuculanidae <i>Nuculana cocentrica</i>		-	-	-	-	-	-
Order: Veneroida							
Family: Corbulidae <i>Caryocorbula caribaea</i> <i>Caryocorbula</i> sp.	2	-	-	-	-	-	-



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Family: Solecurtidae		-	-	-	2	-	-
<i>Tagelus divisus</i>		-	-	-	-	-	-
<i>Tagelus</i> sp.		2	-	-	-	-	-
Family: Tellinidae		-	-	-	-	-	-
<i>Angulus versicolor</i>		-	-	-	-	-	-
<i>Macoma cerina</i>		2	8	-	-	-	6
<i>Macoma</i> sp.		-	-	-	-	-	-
<i>Merisca</i> sp.		-	-	2	-	-	-
Tellinidae (LPIL)		-	-	-	-	-	-
Family: Veneridae		-	-	-	-	-	-
<i>Anomalocardia cuneimeris</i>		-	-	-	-	-	-
<i>Chione cancellata</i>		-	-	-	-	-	-
<i>Chione</i> sp		-	-	-	-	-	-
Order: Unspecified		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Bivalvia (LPIL)		-	-	-	-	-	-
Total Organisms		44	26	11	22	11	19
Total Taxa		10	8	7	7	4	5



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Taxonomic Classification	Station Replicate Collection Date	T08-BN2 A 05/23/13	T08-BN2 B 05/23/13	T08-BN2 C 05/23/13	T10-BN1 A 05/23/13	T10-BN1 B 05/23/13	T10-BN1 C 05/23/13
Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified		-	-	-	4	2	4
Actiniaria (LPIL)							
Class: Unspecified							
Order: Unspecified							
Family: Unspecified							
Cnidaria (LPIL)		-	-	-	-	-	-
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		-	-	-	-	-	-
<i>Capitella</i> sp.	28	44	6	2	2	2	2
Capitellidae (LPIL)	-	-	-	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-	-	-	-
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>	-	-	-	-	-	-	-
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)	-	-	-	-	-	-	-
<i>Ophryotrocha</i> sp.	-	-	-	-	-	-	-
<i>Schistomeringos rudolphii</i>	-	-	-	-	-	-	4
<i>Schistomeringos</i> sp.	-	-	-	-	-	-	-
Family: Lumbrineridae							
<i>Scoletoma</i> sp.	-	-	-	-	-	-	-
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.	-	-	-	-	-	-	-
<i>Scoloplos texana</i>	6	-	-	-	-	-	-
Family: Paraonidae							
<i>Cirrophorus furcatus</i>	2	-	4	12	-	18	
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>	-	-	-	-	-	-	-
<i>Glycera</i> sp.	-	-	2	-	-	-	-
Family: Hesionidae							
Hesionidae (LPIL)	-	-	-	-	-	-	-
<i>Parahesione</i> sp.	-	-	-	-	-	-	16
<i>Podarkeopsis levifuscina</i>	-	-	-	-	-	-	-
Family: Nereididae							
Nereididae (LPIL)	-	-	-	-	-	-	-
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>	-	-	-	-	-	-	-



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Taxonomic Classification	Station Replicate Collection Date	T08-BN2 A 05/23/13	T08-BN2 B 05/23/13	T08-BN2 C 05/23/13	T10-BN1 A 05/23/13	T10-BN1 B 05/23/13	T10-BN1 C 05/23/13
<i>Sigambra tentaculata</i>	-	-	-	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	-
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	-
Sabellidae (LPIL)	-	-	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	-	-	-	-	-	-	-
Magelonidae (LPIL)	-	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	-
<i>Parapriionospio alata</i>	-	-	-	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	-	-	-
<i>Prionospio</i> sp.	-	-	-	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-	-	-	-
Spionidae (LPIL)	-	-	-	-	-	-	2
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	12	4	4	-	2	-	-
<i>Caulleriella</i> sp.	-	-	-	-	-	-	-
Cirratulidae (LPIL)	2	-	6	2	4	-	-
<i>Cirriformia</i> sp.	-	-	-	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	-
<i>Monticellina</i> sp.	-	-	-	-	2	-	-
Family: Sternaspidae							
<i>Sternaspis</i> sp.	2	-	4	-	-	-	-
Class: Clitellata							
Order: Haplotauxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	-	-
Tubificoid Naididae (LPIL)	10	2	6	10	8	-	4
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
Aoridae (LPIL)	-	-	-	-	-	-	-
<i>Grandidierella bonnieroides</i>	-	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	-	-
Family: Palaemonidae							
Palaemonidae (LPIL)	-	-	-	-	-	-	-
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	-	-	-
Penaeidae (LPIL)	-	-	-	-	-	-	-



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Family: Upogebiidae <i>Upogebia affinis</i> <i>Upogebia</i> sp.		-	-	-	-	-	-
Family: Unspecified Decapoda (LPIL) zoea larva Decapoda (LPIL) megalopa larva		-	-	-	-	-	-
Order: Mysida Family: Mysidae <i>Bowmaniella dissimilis</i>		-	-	-	-	-	-
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae <i>Haminoea elegans</i> <i>Haminoea</i> sp.		-	-	-	-	-	-
Order: Cycloneritimorpha							
Family: Neritidae Neritidae (LPIL)		-	-	-	-	-	-
Order: Neogastropoda							
Family: Muricidae <i>Urosalpinx cinerea</i>		-	4	-	-	-	-
Family: Olividae <i>Olivella olssoni</i> <i>Olivella perplexa</i>	2	-	-	-	-	-	-
Order: Neotaenioglossa							
Family: Caecidae <i>Caecum pulchellum</i>		-	-	-	-	-	-
Family: Calyptaeidae <i>Crepidula fornicate</i>		-	-	-	-	-	-
Family: Neritidae <i>Neritina virginea</i>		-	-	-	-	-	-
Order: Unspecified							
Family: Cylichnidae <i>Cylichnella bidentata</i>		-	-	-	-	-	-
Family: Unspecified Gastropoda (LPIL)		-	-	-	-	-	-
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae <i>Arcopsis adamsi</i>		-	-	-	-	-	-
Order: Nuculoida							
Family: Nuculanidae <i>Nuculana cocentrica</i>	2	2	6	-	-	-	-
Order: Veneroida							
Family: Corbulidae <i>Caryocorbula caribaea</i> <i>Caryocorbula</i> sp.		-	-	-	-	-	-



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Taxonomic Classification	Station Replicate Collection Date	T08-BN2 A 05/23/13	T08-BN2 B 05/23/13	T08-BN2 C 05/23/13	T10-BN1 A 05/23/13	T10-BN1 B 05/23/13	T10-BN1 C 05/23/13
Family: Solecurtidae							
<i>Tagelus divisus</i>		2	6	2	2	-	-
<i>Tagelus</i> sp.		-	-	-	-	-	-
Family: Tellinidae							
<i>Angulus versicolor</i>		-	-	-	-	-	-
<i>Macoma cerina</i>		-	8	10	6	-	10
<i>Macoma</i> sp.	8	8	-	-	-	-	12
<i>Merisca</i> sp.	-	-	-	-	-	-	-
Tellinidae (LPIL)	-	-	-	-	-	-	-
Family: Veneridae							
<i>Anomalocardia cuneimeris</i>	2	-	-	-	-	-	-
<i>Chione cancellata</i>	-	-	-	-	-	-	-
<i>Chione</i> sp	-	-	-	-	-	-	-
Order: Unspecified							
Family: Unspecified							
Bivalvia (LPIL)	-	-	-	-	-	-	-
Total Organisms	39	39	25	19	10	36	
Total Taxa	12	8	10	7	6	9	



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Canal Benthic Community
Assessment
Sample Group: PTPLLC Cooling Water
Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T10-BN3 A 05/23/13	T10-BN3 B 05/23/13	T10-BN3 C 05/23/13	T12-BN1 A 05/23/13	T12-BN1 B 05/23/13	T12-BN1 C 05/23/13
Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified							
Actiniaria (LPIL)		6	-	2	-	-	2
Class: Unspecified							
Order: Unspecified							
Family: Unspecified							
Cnidaria (LPIL)		-	-	-	-	-	-
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		-	-	-	-	-	-
<i>Capitella</i> sp.		-	-	-	-	-	-
Capitellidae (LPIL)		-	-	-	-	-	-
<i>Mediomastus californiensis</i>		-	-	-	-	-	-
<i>Mediomastus</i> sp.		-	-	-	-	-	12
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>		-	-	-	-	-	-
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)		-	-	-	-	-	-
<i>Ophryotrocha</i> sp.		-	-	-	-	-	-
<i>Schistomeringos rudolphii</i>		-	-	-	-	-	-
<i>Schistomeringos</i> sp.		-	-	-	-	-	-
Family: Lumbrineridae							
<i>Scoletoma</i> sp.		-	-	-	-	-	-
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.		-	-	-	-	-	-
<i>Scoloplos texana</i>		-	-	-	-	-	-
Family: Paraonidae							
<i>Cirrophorus furcatus</i>		2	-	-	-	2	26
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>		-	-	-	-	-	-
<i>Glycera</i> sp.		-	-	-	-	-	-
Family: Hesionidae							
Hesionidae (LPIL)		-	-	-	-	-	-
<i>Parahesione</i> sp.		2	-	-	2	-	2
<i>Podarkeopsis levifuscina</i>		-	-	-	-	-	-
Family: Nereididae							
Nereididae (LPIL)		-	-	-	-	-	-
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>		-	-	-	-	-	-



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Assessment
Sample Group: PTPLLC Cooling Water
Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

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<i>Sigambra tentaculata</i>	-	-	-	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	-
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	-
Sabellidae (LPIL)	-	-	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	-	-	-	-	2	-	-
Magelonidae (LPIL)	-	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	2
<i>Parapriionospio alata</i>	-	-	-	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	-	-	-
<i>Prionospio</i> sp.	-	-	-	-	-	-	2
<i>Pseudopolydora</i> sp.	-	-	-	-	-	-	-
Spionidae (LPIL)	-	2	-	2	-	-	-
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	2	2	-	8	8	62	
<i>Caulleriella</i> sp.	-	-	-	-	-	-	2
Cirratulidae (LPIL)	6	-	-	2	6	-	-
<i>Cirriformia</i> sp.	-	-	-	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	-
<i>Monticellina</i> sp.	-	-	-	-	-	-	-
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	2	-	-	-	-	-
Class: Clitellata							
Order: Haplotaxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	-	-
Tubificoid Naididae (LPIL)	6	4	-	2	10	-	4
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
Aoridae (LPIL)	-	-	-	-	-	-	-
<i>Grandidierella bonnieroides</i>	-	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	-	-
Family: Palaemonidae							
Palaemonidae (LPIL)	-	-	-	-	-	-	-
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	-	-	-
Penaeidae (LPIL)	-	-	-	-	-	-	-



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Sample Method: Petite Ponar
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Family: Upogebiidae <i>Upogebia affinis</i> <i>Upogebia</i> sp.		-	-	-	-	-	-
Family: Unspecified Decapoda (LPIL) zoea larva Decapoda (LPIL) megalopa larva		-	-	-	-	-	2
Order: Mysida Family: Mysidae <i>Bowmaniella dissimilis</i>		-	-	-	-	-	-
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae <i>Haminoea elegans</i> <i>Haminoea</i> sp.		-	-	-	-	-	-
Order: Cycloneritimorpha							
Family: Neritidae Neritidae (LPIL)		-	-	-	-	-	-
Order: Neogastropoda							
Family: Muricidae <i>Urosalpinx cinerea</i>		-	-	-	-	-	-
Family: Olividae <i>Olivella olssoni</i> <i>Olivella perplexa</i>		-	-	-	-	-	-
Order: Neotaenioglossa							
Family: Caecidae <i>Caecum pulchellum</i>	2	-	-	-	-	2	2
Family: Calyptaeidae <i>Crepidula fornicate</i>		-	-	-	-	-	-
Family: Neritidae <i>Neritina virginea</i>		-	-	-	-	-	-
Order: Unspecified							
Family: Cylichnidae <i>Cylichnella bidentata</i>		-	-	-	-	-	-
Family: Unspecified Gastropoda (LPIL)		-	-	-	-	-	-
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae <i>Arcopsis adamsi</i>		-	-	-	-	-	-
Order: Nuculoida							
Family: Nuculanidae <i>Nuculana cocentrica</i>	2	-	-	-	-	-	-
Order: Veneroida							
Family: Corbulidae <i>Caryocorbula caribaea</i> <i>Caryocorbula</i> sp.		-	-	-	-	-	-



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Family: Solecurtidae		-	-	-	-	-	-
<i>Tagelus divisus</i>		-	-	-	-	-	-
<i>Tagelus</i> sp.	2	2	-	-	-	2	-
Family: Tellinidae		-	-	-	-	-	-
<i>Angulus versicolor</i>	-	-	-	-	-	-	-
<i>Macoma cerina</i>	-	-	-	-	-	10	4
<i>Macoma</i> sp.	-	4	2	2	-	4	2
<i>Merisca</i> sp.	-	-	-	-	-	-	-
Tellinidae (LPIL)	4	-	-	-	-	-	-
Family: Veneridae		-	-	-	-	-	-
<i>Anomalocardia cuneimeris</i>	-	-	-	-	-	-	-
<i>Chione cancellata</i>	-	-	-	-	-	-	-
<i>Chione</i> sp	2	-	-	-	-	-	-
Order: Unspecified		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Bivalvia (LPIL)	-	-	-	-	-	-	-
Total Organisms	18	8	2	10	22	62	
Total Taxa	11	6	2	7	8	13	



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Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified		-	-	-	-	-	-
Actiniaria (LPIL)							
Class: Unspecified		2	-	-	-	-	-
Order: Unspecified							
Family: Unspecified							
Cnidaria (LPIL)							
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		-	-	-	-	-	-
<i>Capitella</i> sp.		-	-	-	2	-	8
Capitellidae (LPIL)		-	-	-	-	-	-
<i>Mediomastus californiensis</i>		-	-	-	-	-	-
<i>Mediomastus</i> sp.		-	-	-	-	-	4
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>		-	-	-	-	-	-
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)		-	2	-	-	-	-
<i>Ophryotrocha</i> sp.		-	-	-	-	-	-
<i>Schistomeringos rudolphii</i>		-	-	-	-	-	-
<i>Schistomeringos</i> sp.		-	-	-	-	2	-
Family: Lumbrineridae							
<i>Scoletoma</i> sp.		-	-	-	-	-	2
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.		-	-	-	-	-	-
<i>Scoloplos texana</i>		-	-	-	-	-	-
Family: Paraonidae							
<i>Cirrophorus furcatus</i>	8	2	-	-	-	20	4
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>	-	-	-	-	-	2	-
<i>Glycera</i> sp.	-	-	2	-	-	-	-
Family: Hesionidae							
Hesionidae (LPIL)	-	-	-	-	-	2	-
<i>Parahesione</i> sp.	12	-	16	-	-	18	-
<i>Podarkeopsis levifuscina</i>	-	-	-	-	-	-	-
Family: Nereididae							
Nereididae (LPIL)	-	-	-	-	-	-	-
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>	-	-	-	-	-	-	-



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<i>Sigambra tentaculata</i>	-	-	-	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	-
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	-
Sabellidae (LPIL)	-	-	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	-	-	-	-	-	2	2
Magelonidae (LPIL)	-	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	-
<i>Parapriionospio alata</i>	-	-	-	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	-	-	-
<i>Prionospio</i> sp.	-	-	-	-	-	4	-
<i>Pseudopolydora</i> sp.	-	-	-	-	-	-	-
Spionidae (LPIL)	-	-	-	-	-	-	4
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	2	4	14	4	6	2	
<i>Caulieriella</i> sp.	-	-	-	-	-	-	4
Cirratulidae (LPIL)	2	-	14	2	10	16	
<i>Cirriformia</i> sp.	-	-	-	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	-
<i>Monticellina</i> sp.	-	-	-	-	-	-	-
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	-	-	-	-	-	-
Class: Clitellata							
Order: Haplotauxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	-	-
Tubificoid Naididae (LPIL)	2	4	2	6	10	16	
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
Aoridae (LPIL)	-	-	-	-	-	-	-
<i>Grandidierella bonnieroides</i>	-	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	2	-
Family: Palaemonidae							
Palaemonidae (LPIL)	-	-	-	-	-	-	-
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	-	-	-
Penaeidae (LPIL)	-	-	-	-	-	-	-



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Family: Upogebiidae		-	-	-	-	-	-
<i>Upogebia affinis</i>		-	-	-	-	-	2
<i>Upogebia</i> sp.		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Decapoda (LPIL) zoea larva		-	-	-	-	-	-
Decapoda (LPIL) megalopa larva		-	-	-	-	-	-
Order: Mysida		-	-	-	-	-	-
Family: Mysidae		-	-	-	-	-	-
<i>Bowmaniella dissimilis</i>		-	-	-	-	-	-
Phylum: Mollusca		-	-	-	-	-	-
Class: Gastropoda		-	-	-	-	-	-
Order: Cephalaspidea		-	-	-	-	-	-
Family: Haminoeidae		-	-	-	-	-	-
<i>Haminoea elegans</i>		-	-	-	-	-	-
<i>Haminoea</i> sp.		-	-	-	-	-	-
Order: Cycloneritimorpha		-	-	-	-	-	-
Family: Neritidae		-	-	-	-	-	-
Neritidae (LPIL)		-	-	-	-	-	-
Order: Neogastropoda		-	-	-	-	-	-
Family: Muricidae		-	-	-	-	-	-
<i>Urosalpinx cinerea</i>		-	-	-	-	-	-
Family: Olividae		-	-	-	-	-	-
<i>Olivella olssoni</i>		-	-	-	-	-	-
<i>Olivella perplexa</i>		-	-	-	-	-	2
Order: Neotaenioglossa		-	-	-	-	-	-
Family: Caecidae		-	-	-	-	-	2
<i>Caecum pulchellum</i>		-	-	-	-	-	-
Family: Calyptaeidae		-	-	-	-	-	2
<i>Crepidula fornicate</i>		-	-	-	-	-	-
Family: Neritidae		-	-	-	-	2	2
<i>Neritina virginea</i>		-	-	-	-	2	2
Order: Unspecified		-	-	-	-	-	-
Family: Cylichnidae		-	-	-	-	-	-
<i>Cylichnella bidentata</i>		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Gastropoda (LPIL)		-	-	-	-	-	-
Class: Bivalvia		-	-	-	-	-	-
Order: Arcoida		-	-	-	-	-	-
Family: Noetiidae		-	-	-	-	-	-
<i>Arcopsis adamsi</i>		-	-	-	-	-	-
Order: Nuculoida		-	-	-	-	-	-
Family: Nuculanidae		-	-	-	-	-	-
<i>Nuculana cocentrica</i>		-	-	-	-	-	-
Order: Veneroida		-	-	-	-	-	-
Family: Corbulidae		-	-	-	-	2	-
<i>Caryocorbula caribaea</i>		-	-	-	-	2	-
<i>Caryocorbula</i> sp.		-	-	-	-	-	-



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Family: Solecurtidae		-	-	-	-	-	-
<i>Tagelus divisus</i>		-	-	-	-	-	-
<i>Tagelus</i> sp.	-	2	-	-	-	-	-
Family: Tellinidae		-	-	-	-	-	-
<i>Angulus versicolor</i>	-	-	-	-	-	-	-
<i>Macoma cerina</i>	-	-	-	-	-	-	2
<i>Macoma</i> sp.	-	-	2	-	-	-	-
<i>Merisca</i> sp.	-	-	-	-	-	-	-
Tellinidae (LPIL)	2	-	-	-	-	-	-
Family: Veneridae		-	-	-	-	-	-
<i>Anomalocardia cuneimeris</i>	-	-	-	-	-	-	-
<i>Chione cancellata</i>	-	-	-	-	-	2	-
<i>Chione</i> sp	-	-	-	-	-	-	-
Order: Unspecified		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Bivalvia (LPIL)	-	-	-	-	-	-	-
Total Organisms	15	7	26	7	42	37	
Total Taxa	7	5	7	4	14	16	



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Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified							
Actiniaria (LPIL)		2	-	-	-	-	2
Class: Unspecified							
Order: Unspecified							
Family: Unspecified							
Cnidaria (LPIL)		-	-	-	-	-	-
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		-	-	-	-	-	-
<i>Capitella</i> sp.		4	-	-	-	-	-
Capitellidae (LPIL)		-	-	-	-	2	-
<i>Mediomastus californiensis</i>		-	-	-	-	-	-
<i>Mediomastus</i> sp.		-	-	-	-	-	-
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>		-	-	-	-	-	-
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)		-	-	-	-	-	-
<i>Ophryotrocha</i> sp.		-	-	-	-	-	-
<i>Schistomeringos rudolphii</i>		-	-	-	-	-	-
<i>Schistomeringos</i> sp.		-	-	-	-	-	-
Family: Lumbrineridae							
<i>Scoletoma</i> sp.		-	-	-	-	-	-
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.		-	-	-	-	-	-
<i>Scoloplos texana</i>		-	-	-	-	-	-
Family: Paraonidae							
<i>Cirrophorus furcatus</i>		4	2	2	2	18	6
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>		-	-	-	-	-	-
<i>Glycera</i> sp.		-	-	-	-	-	-
Family: Hesionidae							
Hesionidae (LPIL)		-	-	-	-	-	-
<i>Parahesione</i> sp.		-	-	-	-	12	-
<i>Podarkeopsis levifuscina</i>		-	-	-	-	4	-
Family: Nereididae							
Nereididae (LPIL)		-	-	-	-	-	-
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>		-	-	-	-	-	-



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Macroinvertebrate Results Raw Data Report (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
Canal Benthic Community
Assessment
Sample Group: PTPLLC Cooling Water
Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T14-BN3 A 05/23/13	T14-BN3 B 05/23/13	T14-BN3 C 05/23/13	T16-BN1 A 05/23/13	T16-BN1 B 05/23/13	T16-BN1 C 05/23/13
<i>Sigambra tentaculata</i>	-	-	-	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	-
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	-
Sabellidae (LPIL)	-	-	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	-	-	-	-	-	-	-
Magelonidae (LPIL)	-	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	-
<i>Parapriionospio alata</i>	-	-	-	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	-	-	-
<i>Prionospio</i> sp.	-	-	-	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-	-	-	-
Spionidae (LPIL)	-	-	-	-	-	4	-
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	-	-	-	-	-	-	-
<i>Caulieriella</i> sp.	-	-	-	-	2	-	-
Cirratulidae (LPIL)	-	-	-	-	20	56	12
<i>Cirriformia</i> sp.	2	6	-	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	-
<i>Monticellina</i> sp.	-	4	2	-	-	-	-
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	-	-	-	-	-	-
Class: Clitellata							
Order: Haplotaxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	-	-
Tubificoid Naididae (LPIL)	2	2	2	-	-	2	4
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
Aoridae (LPIL)	-	-	-	-	-	-	-
<i>Grandidierella bonnieroides</i>	-	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	-	-
Family: Palaemonidae							
Palaemonidae (LPIL)	-	-	-	-	-	-	-
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	-	-	-
Penaeidae (LPIL)	-	-	-	-	-	-	-



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Sample Group: PTPLLC Cooling Water
Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T14-BN3 A 05/23/13	T14-BN3 B 05/23/13	T14-BN3 C 05/23/13	T16-BN1 A 05/23/13	T16-BN1 B 05/23/13	T16-BN1 C 05/23/13
Family: Upogebiidae <i>Upogebia affinis</i> <i>Upogebia</i> sp.		-	-	-	-	-	-
Family: Unspecified Decapoda (LPIL) zoea larva Decapoda (LPIL) megalopa larva		-	-	-	-	-	-
Order: Mysida Family: Mysidae <i>Bowmaniella dissimilis</i>		-	-	-	2	-	-
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae <i>Haminoea elegans</i> <i>Haminoea</i> sp.		-	-	-	-	-	-
Order: Cycloneritimorpha							
Family: Neritidae <i>Neritidae</i> (LPIL)		-	-	-	-	-	-
Order: Neogastropoda							
Family: Muricidae <i>Urosalpinx cinerea</i>	2	-	-	-	-	-	-
Family: Olividae <i>Olivella olssoni</i> <i>Olivella perplexa</i>		-	-	-	-	-	-
Order: Neotaenioglossa							
Family: Caecidae <i>Caecum pulchellum</i>		-	-	-	-	-	-
Family: Calyptaeidae <i>Crepidula fornicate</i>		-	-	-	-	-	-
Family: Neritidae <i>Neritina virginea</i>		-	-	-	-	-	-
Order: Unspecified							
Family: Cylichnidae <i>Cylichnella bidentata</i>		-	-	-	-	-	-
Family: Unspecified Gastropoda (LPIL)		-	-	-	-	-	-
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae <i>Arcopsis adamsi</i>		-	-	-	-	-	-
Order: Nuculoida							
Family: Nuculanidae <i>Nuculana cocentrica</i>		-	-	-	-	-	-
Order: Veneroida							
Family: Corbulidae <i>Caryocorbula caribaea</i> <i>Caryocorbula</i> sp.		-	-	-	-	2	-



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Family: Solecurtidae		-	-	-	-	-	-
<i>Tagelus divisus</i>		-	-	-	-	-	-
<i>Tagelus</i> sp.		-	-	-	-	-	-
Family: Tellinidae		-	-	-	-	-	-
<i>Angulus versicolor</i>		-	-	-	-	-	-
<i>Macoma cerina</i>		-	-	-	-	-	-
<i>Macoma</i> sp.		-	-	-	-	-	-
<i>Merisca</i> sp.		-	-	-	-	-	-
Tellinidae (LPIL)		-	-	-	-	-	-
Family: Veneridae		-	-	-	-	-	-
<i>Anomalocardia cuneimeris</i>		-	-	-	-	-	-
<i>Chione cancellata</i>		-	-	-	-	-	-
<i>Chione</i> sp		-	-	-	-	-	-
Order: Unspecified		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Bivalvia (LPIL)		-	-	-	-	-	-
Total Organisms		8	7	3	13	49	13
Total Taxa		6	4	3	4	7	5



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Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified		-	2	-	-	2	-
Actiniaria (LPIL)							
Class: Unspecified							
Order: Unspecified							
Family: Unspecified		-	-	-	-	-	-
Cnidaria (LPIL)							
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		-	-	-	-	-	-
<i>Capitella</i> sp.		-	-	-	-	-	-
Capitellidae (LPIL)		-	-	-	-	-	-
<i>Mediomastus californiensis</i>		-	-	-	-	-	-
<i>Mediomastus</i> sp.		-	-	-	-	-	-
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>		-	-	-	-	-	-
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)		-	-	-	-	-	-
<i>Ophryotrocha</i> sp.		-	-	-	-	-	-
<i>Schistomeringos rudolphii</i>		-	-	-	-	-	-
<i>Schistomeringos</i> sp.		-	-	-	-	-	-
Family: Lumbrineridae							
<i>Scoletoma</i> sp.		-	-	-	-	-	-
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.		-	-	-	-	-	-
<i>Scoloplos texana</i>		-	-	-	-	-	-
Family: Paraonidae							
<i>Cirrophorus furcatus</i>	2	8	-	14	-	4	
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>	-	-	-	2	-	-	
<i>Glycera</i> sp.	-	-	-	-	-	-	
Family: Hesionidae							
Hesionidae (LPIL)	-	-	-	-	-	-	
<i>Parahesione</i> sp.	4	4	-	2	-	-	
<i>Podarkeopsis levifuscina</i>	-	-	-	-	-	-	
Family: Nereididae							
Nereididae (LPIL)	-	-	-	-	-	-	
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>	-	-	-	-	-	-	



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Taxonomic Classification	Station Replicate Collection Date	T16-BN3 A 05/23/13	T16-BN3 B 05/23/13	T16-BN3 C 05/23/13	T18-BN1 A 05/23/13	T18-BN1 B 05/23/13	T18-BN1 C 05/23/13
<i>Sigambra tentaculata</i>	-	-	-	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	-
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	-
Sabellidae (LPIL)	-	-	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	-	-	-	-	-	-	-
Magelonidae (LPIL)	-	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	2	-	-
<i>Parapriionospio alata</i>	-	-	-	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	-	-	-
<i>Prionospio</i> sp.	-	-	-	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-	-	-	-
Spionidae (LPIL)	-	-	-	-	-	-	-
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	-	-	-	-	38	24	18
<i>Caulieriella</i> sp.	-	-	-	-	2	8	2
Cirratulidae (LPIL)	6	2	2	18	18	18	44
<i>Cirriformia</i> sp.	-	-	-	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	-
<i>Monticellina</i> sp.	-	-	-	-	6	-	-
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	-	-	-	8	-	-
Class: Clitellata							
Order: Haplotauxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	-	-
Tubificoid Naididae (LPIL)	-	-	-	-	2	8	8
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
Aoridae (LPIL)	-	-	-	-	-	-	-
<i>Grandidierella bonnieroides</i>	-	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	-	-
Family: Palaemonidae							
Palaemonidae (LPIL)	-	-	-	-	2	-	-
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	-	-	-
Penaeidae (LPIL)	-	-	-	-	-	-	-



Macroinvertebrate Results

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Family: Upogebiidae		-	-	-	-	-	-
<i>Upogebia affinis</i>		-	-	-	-	-	-
<i>Upogebia</i> sp.		-	-	-	2	-	-
Family: Unspecified		-	-	2	-	-	-
Decapoda (LPIL) zoea larva		-	-	2	-	-	-
Decapoda (LPIL) megalopa larva		-	-	-	-	-	-
Order: Mysida		-	-	-	-	-	-
Family: Mysidae		-	-	-	-	-	-
<i>Bowmaniella dissimilis</i>		-	-	-	-	-	-
Phylum: Mollusca		-	-	-	-	-	-
Class: Gastropoda		-	-	-	-	-	-
Order: Cephalaspidea		-	-	-	-	-	-
Family: Haminoeidae		-	-	-	-	-	-
<i>Haminoea elegans</i>		-	-	-	-	-	-
<i>Haminoea</i> sp.		-	-	-	-	-	-
Order: Cycloneritimorpha		-	-	-	-	-	-
Family: Neritidae		-	-	-	-	-	-
Neritidae (LPIL)		-	-	-	-	-	-
Order: Neogastropoda		-	-	-	-	-	-
Family: Muricidae		-	-	-	-	-	-
<i>Urosalpinx cinerea</i>		-	-	-	-	-	-
Family: Olividae		-	-	-	-	-	-
<i>Olivella olssoni</i>		-	-	-	-	-	-
<i>Olivella perplexa</i>		-	-	-	-	-	-
Order: Neotaenioglossa		-	-	-	-	-	-
Family: Caecidae		-	-	-	-	-	-
<i>Caecum pulchellum</i>		-	-	-	-	-	-
Family: Calyptraeidae		-	-	-	-	-	-
<i>Crepidula fornicate</i>		-	-	-	-	-	-
Family: Neritidae		-	-	-	-	-	-
<i>Neritina virginea</i>		-	-	-	-	-	-
Order: Unspecified		-	-	-	-	-	-
Family: Cylichnidae		-	-	-	-	-	-
<i>Cylichnella bidentata</i>		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Gastropoda (LPIL)		-	-	-	-	-	-
Class: Bivalvia		-	-	-	-	-	-
Order: Arcoida		-	-	-	-	-	2
Family: Noetiidae		-	-	-	-	-	-
<i>Arcopsis adamsi</i>		-	-	-	-	-	-
Order: Nuculoida		-	-	-	-	-	-
Family: Nuculanidae		-	-	-	-	-	-
<i>Nuculana cocentrica</i>		-	-	-	-	-	-
Order: Veneroida		-	-	-	-	-	-
Family: Corbulidae		-	-	-	-	2	-
<i>Caryocorbula caribaea</i>		-	-	-	-	-	-
<i>Caryocorbula</i> sp.		-	-	-	-	-	-



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Family: Solecurtidae		-	-	-	-	-	-
<i>Tagelus divisus</i>		-	-	-	-	-	-
<i>Tagelus</i> sp.		-	-	-	-	-	-
Family: Tellinidae		-	-	-	-	-	-
<i>Angulus versicolor</i>		-	-	-	-	-	-
<i>Macoma cerina</i>		-	-	-	-	-	-
<i>Macoma</i> sp.		-	-	-	-	-	-
<i>Merisca</i> sp.		-	-	-	-	-	-
Tellinidae (LPIL)		-	-	-	-	-	-
Family: Veneridae		-	-	-	-	-	-
<i>Anomalocardia cuneimeris</i>		-	-	-	-	-	-
<i>Chione cancellata</i>		-	-	-	-	-	-
<i>Chione</i> sp		-	-	-	-	-	-
Order: Unspecified		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Bivalvia (LPIL)		-	-	-	-	-	-
Total Organisms		6	8	2	49	31	39
Total Taxa		3	4	2	12	6	6



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Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified		-	-	-	-	-	-
Actiniaria (LPIL)							
Class: Unspecified							
Order: Unspecified							
Family: Unspecified							
Cnidaria (LPIL)		-	-	-	-	-	-
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		-	-	-	-	-	-
<i>Capitella</i> sp.		-	-	-	2	2	2
Capitellidae (LPIL)		-	-	-	-	-	-
<i>Mediomastus californiensis</i>	2	-	-	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-	-	-	4
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>	10	-	-	-	-	-	-
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)	-	-	-	-	-	-	-
<i>Ophryotrocha</i> sp.	-	-	-	-	-	-	-
<i>Schistomeringos rudolphii</i>	-	-	-	-	-	-	-
<i>Schistomeringos</i> sp.	-	-	-	-	-	-	-
Family: Lumbrineridae							
<i>Scoletoma</i> sp.	2	-	-	-	-	-	-
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.	-	-	-	-	6	-	-
<i>Scoloplos texana</i>	2	-	2	-	-	-	-
Family: Paraonidae							
<i>Cirrophorus furcatus</i>	20	-	8	46	4	4	4
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>	-	-	-	-	-	-	2
<i>Glycera</i> sp.	-	-	-	-	-	-	-
Family: Hesionidae							
Hesionidae (LPIL)	-	-	-	-	-	-	-
<i>Parahesione</i> sp.	6	-	2	-	-	-	-
<i>Podarkeopsis levifuscina</i>	-	-	-	-	-	-	-
Family: Nereididae							
Nereididae (LPIL)	-	-	-	-	-	-	-
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>	-	-	-	2	-	-	-



Macroinvertebrate Results

Raw Data Report (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T18-BN3 A 05/23/13	T18-BN3 B 05/23/13	T18-BN3 C 05/23/13	T20-BN1 A 05/23/13	T20-BN1 B 05/23/13	T20-BN1 C 05/23/13
<i>Sigambra tentaculata</i>	-	-	-	-	-	2	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	-
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	2
Sabellidae (LPIL)	-	-	-	-	2	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	-	-	-	-	8	6	6
Magelonidae (LPIL)	-	2	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	-
<i>Parapriionospio alata</i>	-	-	-	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	-	-	-
<i>Prionospio</i> sp.	-	-	-	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-	-	-	-
Spionidae (LPIL)	-	-	-	-	2	-	4
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	-	12	56	24	58	20	
<i>Caulleriella</i> sp.	2	-	-	2	2	-	
Cirratulidae (LPIL)	52	18	20	46	40	6	
<i>Cirriformia</i> sp.	-	-	-	-	-	-	
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	2
<i>Monticellina</i> sp.	-	-	-	-	-	-	
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	-	-	-	-	-	2
Class: Clitellata							
Order: Haplotauxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	-	
Tubificoid Naididae (LPIL)	-	2	6	6	-	-	
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
Aoridae (LPIL)	2	-	-	-	-	-	
<i>Grandidierella bonnieroides</i>	-	-	-	-	-	-	
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	-	
Family: Palaemonidae							
Palaemonidae (LPIL)	-	-	-	-	-	-	
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	-	-	
Penaeidae (LPIL)	-	-	2	-	-	-	



Macroinvertebrate Results

Raw Data Report (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
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Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T18-BN3 A 05/23/13	T18-BN3 B 05/23/13	T18-BN3 C 05/23/13	T20-BN1 A 05/23/13	T20-BN1 B 05/23/13	T20-BN1 C 05/23/13
Family: Upogebiidae							
<i>Upogebia affinis</i>		2	-	2	-	-	-
<i>Upogebia</i> sp.		2	-	-	-	2	-
Family: Unspecified							
Decapoda (LPIL) zoea larva		2	-	-	-	-	-
Decapoda (LPIL) megalopa larva		-	-	-	-	-	-
Order: Mysida							
Family: Mysidae							
<i>Bowmaniella dissimilis</i>		-	-	-	-	-	-
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae							
<i>Haminoea elegans</i>		-	2	2	-	-	-
<i>Haminoea</i> sp.		-	-	-	-	-	-
Order: Cycloneritimorpha							
Family: Neritidae							
<i>Neritidae</i> (LPIL)		-	-	-	-	-	-
Order: Neogastropoda							
Family: Muricidae							
<i>Urosalpinx cinerea</i>		-	-	-	2	-	-
Family: Olividae							
<i>Olivella olssoni</i>		-	-	-	-	-	-
<i>Olivella perplexa</i>		-	-	-	-	6	4
Order: Neotaenioglossa							
Family: Caecidae							
<i>Caecum pulchellum</i>		-	-	-	-	-	-
Family: Calyptraeidae							
<i>Crepidula fornicate</i>		-	-	-	-	-	-
Family: Neritidae							
<i>Neritina virginea</i>		-	-	-	-	-	-
Order: Unspecified							
Family: Cylichnidae							
<i>Cylichnella bidentata</i>		-	-	-	-	-	-
Family: Unspecified							
Gastropoda (LPIL)		-	-	-	-	-	-
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae							
<i>Arcopsis adamsi</i>		-	-	-	-	-	-
Order: Nuculoida							
Family: Nuculanidae							
<i>Nuculana cocentrica</i>		-	-	2	2	-	-
Order: Veneroida							
Family: Corbulidae							
<i>Caryocorbula caribaea</i>		-	-	-	-	-	-
<i>Caryocorbula</i> sp.		-	-	-	-	-	-



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Macroinvertebrate Results Raw Data Report (Unpooled)

Prepared For: CH2M HILL
Project: PTPLLC Cooling Water
Canal Benthic Community
Assessment
Sample Group: PTPLLC Cooling Water
Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	T18-BN3 A 05/23/13	T18-BN3 B 05/23/13	T18-BN3 C 05/23/13	T20-BN1 A 05/23/13	T20-BN1 B 05/23/13	T20-BN1 C 05/23/13
Family: Solecurtidae		-	-	-	-	-	-
<i>Tagelus divisus</i>		-	-	-	-	-	-
<i>Tagelus</i> sp.		-	-	-	-	-	-
Family: Tellinidae		-	-	-	-	-	-
<i>Angulus versicolor</i>		-	-	-	-	-	-
<i>Macoma cerina</i>		-	-	-	-	-	-
<i>Macoma</i> sp.		-	-	-	-	-	-
<i>Merisca</i> sp.		-	-	-	-	-	-
Tellinidae (LPIL)		-	-	-	-	-	-
Family: Veneridae		-	-	-	-	-	-
<i>Anomalocardia cuneimeris</i>		-	-	-	-	-	-
<i>Chione cancellata</i>		-	-	-	-	-	-
<i>Chione</i> sp		-	-	-	-	-	-
Order: Unspecified		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Bivalvia (LPIL)		-	-	-	-	-	-
Total Organisms		52	18	51	75	61	29
Total Taxa		12	5	10	13	9	12



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Taxonomic Classification	Station Replicate Collection Date	T20-BN3 A 05/23/13	T20-BN3 B 05/23/13	T20-BN3 C 05/23/13	BKG-BN1 A 05/23/13	BKG-BN1 B 05/23/13	BKG-BN1 C 05/23/13
Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified		-	-	-	-	-	-
Actiniaria (LPIL)							
Class: Unspecified							
Order: Unspecified							
Family: Unspecified		-	-	-	-	-	-
Cnidaria (LPIL)							
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		-	-	-	-	2	-
<i>Capitella</i> sp.		-	-	-	-	-	-
Capitellidae (LPIL)		-	-	-	-	-	-
<i>Mediomastus californiensis</i>		-	-	-	-	-	-
<i>Mediomastus</i> sp.		-	-	-	-	-	-
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>		-	-	-	-	-	-
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)		2	-	-	-	-	-
<i>Ophryotrocha</i> sp.		-	-	-	-	-	-
<i>Schistomeringos rudolphii</i>		-	-	-	-	-	-
<i>Schistomeringos</i> sp.		-	-	-	-	-	-
Family: Lumbrineridae							
<i>Scoletoma</i> sp.		-	-	-	2	-	-
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.		2	-	-	-	-	-
<i>Scoloplos texana</i>		-	-	4	-	-	-
Family: Paraonidae							
<i>Cirrophorus furcatus</i>		4	-	-	-	-	-
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>		-	-	-	-	-	-
<i>Glycera</i> sp.		-	-	-	-	-	-
Family: Hesionidae							
Hesionidae (LPIL)		-	-	-	-	-	-
<i>Parahesione</i> sp.		-	-	-	-	-	-
<i>Podarkeopsis levifuscina</i>		-	-	-	-	-	-
Family: Nereididae							
Nereididae (LPIL)		-	-	-	-	-	4
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>		-	-	-	-	-	-



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Sample Group: PTPLLC Cooling Water
Canal Benthic Community

Sample Method: Petite Ponar
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Taxonomic Classification	Station Replicate Collection Date	T20-BN3 A 05/23/13	T20-BN3 B 05/23/13	T20-BN3 C 05/23/13	BKG-BN1 A 05/23/13	BKG-BN1 B 05/23/13	BKG-BN1 C 05/23/13
<i>Sigambra tentaculata</i>	-	-	-	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	-	-	-
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	-
Sabellidae (LPIL)	-	-	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	2	14	10	-	-	-	-
Magelonidae (LPIL)	-	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	-
<i>Parapriionospio alata</i>	-	-	2	-	-	-	-
<i>Prionospio cristata</i>	-	-	-	-	-	-	-
<i>Prionospio</i> sp.	-	-	-	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-	-	-	-
Spionidae (LPIL)	-	-	-	-	-	-	-
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	98	170	104	-	-	-	-
<i>Caulieriella</i> sp.	-	-	-	-	-	2	-
Cirratulidae (LPIL)	20	34	12	-	-	-	2
<i>Cirriformia</i> sp.	-	-	-	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	-
<i>Monticellina</i> sp.	-	-	-	-	-	-	-
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	-	-	-	-	-	-
Class: Clitellata							
Order: Haplotauxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	2	-
Tubificoid Naididae (LPIL)	-	-	2	12	24	-	46
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
Aoridae (LPIL)	-	-	-	-	-	-	-
<i>Grandidierella bonnieroides</i>	-	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	-	-
Family: Palaemonidae							
Palaemonidae (LPIL)	-	-	-	-	-	-	-
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	-	-	-	-	-
Penaeidae (LPIL)	-	-	-	-	-	-	-



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Family: Upogebiidae <i>Upogebia affinis</i> <i>Upogebia</i> sp.		-	-	-	-	-	-
Family: Unspecified Decapoda (LPIL) zoea larva Decapoda (LPIL) megalopa larva		-	-	-	2	-	-
Order: Mysida		-	-	-	-	-	-
Family: Mysidae <i>Bowmaniella dissimilis</i>		-	-	-	-	-	-
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae <i>Haminoea elegans</i> <i>Haminoea</i> sp.		-	-	-	-	-	-
Order: Cycloneritimorpha							
Family: Neritidae Neritidae (LPIL)		-	-	-	-	-	-
Order: Neogastropoda							
Family: Muricidae <i>Urosalpinx cinerea</i>	2	-	-	-	-	-	-
Family: Olividae <i>Olivella olssoni</i> <i>Olivella perplexa</i>		-	-	-	-	-	-
Order: Neotaenioglossa							
Family: Caecidae <i>Caecum pulchellum</i>		-	-	-	-	-	-
Family: Calyptaeidae <i>Crepidula fornicate</i>		-	-	-	-	-	-
Family: Neritidae <i>Neritina virginea</i>		-	-	-	-	-	-
Order: Unspecified							
Family: Cylichnidae <i>Cylichnella bidentata</i>		-	-	-	-	-	-
Family: Unspecified Gastropoda (LPIL)		-	-	-	-	-	-
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae <i>Arcopsis adamsi</i>		-	-	-	-	-	-
Order: Nuculoida							
Family: Nuculanidae <i>Nuculana cocentrica</i>		-	-	-	-	-	-
Order: Veneroida							
Family: Corbulidae <i>Caryocorbula caribaea</i> <i>Caryocorbula</i> sp.		-	-	-	2	-	-



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Family: Solecurtidae		-	-	-	-	-	-
<i>Tagelus divisus</i>		-	-	-	-	-	-
<i>Tagelus</i> sp.		-	-	-	-	-	-
Family: Tellinidae		-	-	-	-	-	-
<i>Angulus versicolor</i>		-	-	-	-	-	-
<i>Macoma cerina</i>		-	-	-	-	-	-
<i>Macoma</i> sp.		-	-	-	-	-	-
<i>Merisca</i> sp.		-	-	-	-	-	-
Tellinidae (LPIL)		-	-	-	-	-	-
Family: Veneridae		-	-	-	-	-	-
<i>Anomalocardia cuneimeris</i>		-	-	-	-	-	-
<i>Chione cancellata</i>	2	-	-	-	-	-	-
<i>Chione</i> sp		-	-	-	-	-	-
Order: Unspecified		-	-	-	-	-	-
Family: Unspecified		-	-	-	-	-	-
Bivalvia (LPIL)		-	-	-	-	-	-
Total Organisms	66	109	68	8	15	26	
Total Taxa	8	3	7	3	4	3	



Macroinvertebrate Results

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Sample Method: Petite Ponar
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Taxonomic Classification	Station Replicate Collection Date	BKG-BN2 A 05/23/13	BKG-BN2 B 05/23/13	BKG-BN2 C 05/23/13	BKG-BN3 A 05/21/13	BKG-BN3 B 05/21/13	BKG-BN3 C 05/21/13
Phylum: Cnidaria							
Class: Anthozoa							
Order: Actiniaria							
Family: Unspecified		-	-	-	-	-	-
Actiniaria (LPIL)							
Class: Unspecified							
Order: Unspecified							
Family: Unspecified							
Cnidaria (LPIL)		-	-	-	-	-	-
Phylum: Annelida							
Class: Polychaeta							
Order: Capitellida							
Family: Capitellidae							
<i>Capitella capitata</i> complex Blake		-	2	-	-	-	-
<i>Capitella</i> sp.	2	-	-	6	-	-	-
Capitellidae (LPIL)	-	-	-	-	-	-	-
<i>Mediomastus californiensis</i>	-	-	-	-	-	-	-
<i>Mediomastus</i> sp.	-	-	-	-	-	-	-
Order: Cossurida							
Family: Cossuridae							
<i>Cossura delta</i>	-	-	-	-	-	-	-
Order: Eunicida							
Family: Dorvilleidae							
Dorvilleidae (LPIL)	-	-	-	-	2	8	8
<i>Ophryotrocha</i> sp.	-	-	-	-	-	-	-
<i>Schistomeringos rudolphii</i>	-	-	-	-	-	-	-
<i>Schistomeringos</i> sp.	-	-	-	-	-	-	-
Family: Lumbrineridae							
<i>Scoletoma</i> sp.	2	2	2	-	-	-	-
Order: Orbiniida							
Family: Orbiniidae							
<i>Scoloplos</i> sp.	-	-	-	-	-	-	-
<i>Scoloplos texana</i>	-	-	-	-	-	-	-
Family: Paraonidae							
<i>Cirrophorus furcatus</i>	-	-	-	-	-	-	-
Order: Phyllodocida							
Family: Glyceridae							
<i>Glycera brevicirris</i>	-	-	-	-	-	-	-
<i>Glycera</i> sp.	-	-	-	-	-	-	-
Family: Hesionidae							
Hesionidae (LPIL)	-	-	-	-	-	-	-
<i>Parahesione</i> sp.	-	-	-	-	-	-	-
<i>Podarkeopsis levifuscina</i>	-	-	-	-	-	-	-
Family: Nereididae							
Nereididae (LPIL)	-	2	-	-	-	-	-
Family: Pilargidae							
<i>Ancistrosyllis jonesi</i>	-	-	-	-	-	-	-



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Macroinvertebrate Results

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 Canal Benthic Community
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Sample Group: PTPLLC Cooling Water
 Canal Benthic Community

Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	BKG-BN2 A 05/23/13	BKG-BN2 B 05/23/13	BKG-BN2 C 05/23/13	BKG-BN3 A 05/21/13	BKG-BN3 B 05/21/13	BKG-BN3 C 05/21/13
<i>Sigambra tentaculata</i>	-	-	-	-	-	-	-
Family: Syllidae							
<i>Sphaerosyllis</i> sp.	-	-	-	-	18	24	88
Order: Sabellida							
Family: Sabellidae							
<i>Bispira melanostigma</i>	-	-	-	-	-	-	-
Sabellidae (LPIL)	-	-	-	-	-	-	-
Order: Spionida							
Family: Magelonidae							
<i>Magelona pettiboneae</i>	-	2	-	-	-	-	-
Magelonidae (LPIL)	-	-	-	-	-	-	-
Family: Spionidae							
<i>Minuspio</i> sp.	-	-	-	-	-	-	-
<i>Parapriionospio alata</i>	-	-	-	-	-	-	-
<i>Prionospio cristata</i>	-	-	28	-	-	-	-
<i>Prionospio</i> sp.	8	2	-	-	-	-	-
<i>Pseudopolydora</i> sp.	-	-	-	-	-	-	-
Spionidae (LPIL)	-	-	-	-	-	-	-
Order: Terebellida							
Family: Cirratulidae							
<i>Aphelochaeta</i> sp.	18	24	36	-	-	-	-
<i>Caulieriella</i> sp.	-	2	8	-	-	-	-
Cirratulidae (LPIL)	18	14	30	-	-	-	-
<i>Cirriformia</i> sp.	-	-	-	-	-	-	-
<i>Cirriformia</i> sp. B Vittor	-	-	-	-	-	-	-
<i>Monticellina</i> sp.	-	-	-	-	-	-	-
Family: Sternaspidae							
<i>Sternaspis</i> sp.	-	-	-	-	-	-	-
Class: Clitellata							
Order: Haplotauxida							
Family: Tubificoid Naididae							
<i>Tectidrilus squalidus</i>	-	-	-	-	-	-	-
Tubificoid Naididae (LPIL)	48	34	80	24	12	36	
Phylum: Arthropoda							
Class: Malacostraca							
Order: Amphipoda							
Family: Aoridae							
Aoridae (LPIL)	2	-	-	-	-	-	-
<i>Grandidierella bonnieroides</i>	-	-	-	-	-	-	-
Order: Decapoda							
Family: Alpheidae							
<i>Alpheus</i> sp.	-	-	-	-	-	-	-
Family: Palaemonidae							
Palaemonidae (LPIL)	-	-	-	-	-	-	-
Family: Penaeidae							
<i>Lucifer</i> sp.	-	-	2	-	-	-	-
Penaeidae (LPIL)	-	-	2	-	-	-	-



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Raw Data Report (Unpooled)

Prepared For: CH2M HILL
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 Canal Benthic Community
 Assessment
Sample Group: PTPLLC Cooling Water
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Sample Method: Petite Ponar
Report Date: 07/25/2013

Taxonomic Classification	Station Replicate Collection Date	BKG-BN2 A 05/23/13	BKG-BN2 B 05/23/13	BKG-BN2 C 05/23/13	BKG-BN3 A 05/21/13	BKG-BN3 B 05/21/13	BKG-BN3 C 05/21/13
Family: Upogebiidae <i>Upogebia affinis</i> <i>Upogebia</i> sp.		-	-	-	-	-	-
Family: Unspecified Decapoda (LPIL) zoea larva Decapoda (LPIL) megalopa larva	8	10	24	-	-	-	-
Order: Mysida Family: Mysidae <i>Bowmaniella dissimilis</i>		-	-	-	-	-	-
Phylum: Mollusca							
Class: Gastropoda							
Order: Cephalaspidea							
Family: Haminoeidae <i>Haminoea elegans</i> <i>Haminoea</i> sp.		-	-	-	-	-	-
Order: Cycloneritimorpha							
Family: Neritidae Neritidae (LPIL)		-	-	-	-	-	-
Order: Neogastropoda							
Family: Muricidae <i>Urosalpinx cinerea</i>		-	-	-	-	-	-
Family: Olividae <i>Olivella olssoni</i> <i>Olivella perplexa</i>	2	-	-	-	-	-	-
Order: Neotaenioglossa							
Family: Caecidae <i>Caecum pulchellum</i>		-	-	-	-	-	-
Family: Calyptaeidae <i>Crepidula fornicate</i>		-	-	-	-	-	-
Family: Neritidae <i>Neritina virginea</i>		-	-	-	-	-	-
Order: Unspecified							
Family: Cylichnidae <i>Cylichnella bidentata</i>		-	-	2	-	-	-
Family: Unspecified Gastropoda (LPIL)		-	-	2	-	-	-
Class: Bivalvia							
Order: Arcoida							
Family: Noetiidae <i>Arcopsis adamsi</i>		-	-	-	-	-	-
Order: Nuculoida							
Family: Nuculanidae <i>Nuculana cocentrica</i>	2	-	2	-	-	-	-
Order: Veneroida							
Family: Corbulidae <i>Caryocorbula caribaea</i> <i>Caryocorbula</i> sp.		-	-	-	-	-	-



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Taxonomic Classification	Station Replicate Collection Date	BKG-BN2 A 05/23/13	BKG-BN2 B 05/23/13	BKG-BN2 C 05/23/13	BKG-BN3 A 05/21/13	BKG-BN3 B 05/21/13	BKG-BN3 C 05/21/13
Family: Solecurtidae		-	-	-	-	-	-
<i>Tagelus divisus</i>		-	-	-	-	-	-
<i>Tagelus</i> sp.		-	-	-	-	-	-
Family: Tellinidae			2	-	-	-	-
<i>Angulus versicolor</i>		-	2	-	-	-	-
<i>Macoma cerina</i>		-	-	2	-	-	10
<i>Macoma</i> sp.		-	-	-	-	-	-
<i>Merisca</i> sp.		-	-	-	-	-	-
Tellinidae (LPIL)		-	-	-	-	-	-
Family: Veneridae							
<i>Anomalocardia cuneimeris</i>		-	-	-	-	-	-
<i>Chione cancellata</i>		-	-	-	-	-	-
<i>Chione</i> sp		-	-	-	-	-	-
Order: Unspecified							
Family: Unspecified							
Bivalvia (LPIL)		-	-	-	6	4	20
Total Organisms		55	48	113	25	24	81
Total Taxa		10	11	14	4	4	5



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Taxonomic Classification	Station Replicate Collection Date	BKG-BN4 A 05/21/13	BKG-BN4 B 05/21/13	BKG-BN4 C 05/21/13
Phylum: Cnidaria Class: Anthozoa Order: Actiniaria Family: Unspecified <i>Actiniaria</i> (LPIL)		-	-	-
Class: Unspecified Order: Unspecified Family: Unspecified <i>Cnidaria</i> (LPIL)		-	-	-
Phylum: Annelida Class: Polychaeta Order: Capitellida Family: Capitellidae <i>Capitella capitata</i> complex Blake <i>Capitella</i> sp. <i>Capitellidae</i> (LPIL) <i>Mediomastus californiensis</i> <i>Mediomastus</i> sp.		-	-	-
Order: Cossurida Family: Cossuridae <i>Cossura delta</i>		-	-	-
Order: Eunicida Family: Dorvilleidae <i>Dorvilleidae</i> (LPIL) <i>Ophryotrocha</i> sp. <i>Schistomeringos rudolphii</i> <i>Schistomeringos</i> sp.	8	2	-	10
Family: Lumbrineridae <i>Scoletoma</i> sp.	-	-	-	-
Order: Orbiniida Family: Orbiniidae <i>Scoloplos</i> sp. <i>Scoloplos texana</i>	-	-	-	-
Family: Paraonidae <i>Cirrophorus furcatus</i>	-	2	-	-
Order: Phyllodocida Family: Glyceridae <i>Glycera brevicirris</i> <i>Glycera</i> sp.	-	-	-	-
Family: Hesionidae <i>Hesionidae</i> (LPIL) <i>Parahesione</i> sp. <i>Podarkeopsis levifuscina</i>	-	-	-	-
Family: Nereididae <i>Nereididae</i> (LPIL)	-	-	-	-
Family: Pilargidae <i>Ancistrosyllis jonesi</i>	-	-	-	-



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Taxonomic Classification	Station Replicate Collection Date	BKG-BN4 A 05/21/13	BKG-BN4 B 05/21/13	BKG-BN4 C 05/21/13
<i>Sigambra tentaculata</i>	-	-	-	-
Family: Syllidae				
<i>Sphaerosyllis</i> sp.	46	4	54	
Order: Sabellida				
Family: Sabellidae				
<i>Bispira melanostigma</i>	-	-	-	
Sabellidae (LPIL)	-	-	-	
Order: Spionida				
Family: Magelonidae				
<i>Magelona pectiboneae</i>	-	-	-	
Magelonidae (LPIL)	-	-	-	
Family: Spionidae				
<i>Minuspio</i> sp.	-	-	-	
<i>Parapriionospio alata</i>	-	-	-	
<i>Prionospio cristata</i>	-	-	-	
<i>Prionospio</i> sp.	-	-	-	
<i>Pseudopolydora</i> sp.	-	-	-	
Spionidae (LPIL)	-	-	-	
Order: Terebellida				
Family: Cirratulidae				
<i>Aphelochaeta</i> sp.	-	-	-	
<i>Caulleriella</i> sp.	-	-	-	
Cirratulidae (LPIL)	-	-	-	
<i>Cirriformia</i> sp.	-	-	-	
<i>Cirriformia</i> sp. B Vittor	-	-	-	
<i>Monticellina</i> sp.	-	-	-	
Family: Sternaspidae				
<i>Sternaspis</i> sp.	-	-	-	
Class: Clitellata				
Order: Haplotauxida				
Family: Tubificoid Naididae				
<i>Tectidrilus squalidus</i>	-	-	-	
Tubificoid Naididae (LPIL)	22	4	46	
Phylum: Arthropoda				
Class: Malacostraca				
Order: Amphipoda				
Family: Aoridae				
Aoridae (LPIL)	-	-	-	
<i>Grandidierella bonnieroides</i>	-	-	-	
Order: Decapoda				
Family: Alpheidae				
<i>Alpheus</i> sp.	-	-	-	
Family: Palaemonidae				
Palaemonidae (LPIL)	-	-	-	
Family: Penaeidae				
<i>Lucifer</i> sp.	-	-	-	
Penaeidae (LPIL)	-	-	-	



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Family: Upogebiidae <i>Upogebia affinis</i> <i>Upogebia</i> sp.		-	-	-
Family: Unspecified Decapoda (LPIL) zoea larva Decapoda (LPIL) megalopa larva		-	-	-
Order: Mysida Family: Mysidae <i>Bowmaniella dissimilis</i>		-	-	-
Phylum: Mollusca				
Class: Gastropoda				
Order: Cephalaspidea				
Family: Haminoeidae <i>Haminoea elegans</i> <i>Haminoea</i> sp.		-	-	-
Order: Cycloneritimorpha				
Family: Neritidae Neritidae (LPIL)		-	-	-
Order: Neogastropoda				
Family: Muricidae <i>Urosalpinx cinerea</i>		-	-	-
Family: Olividae <i>Olivella olssoni</i> <i>Olivella perplexa</i>		-	-	-
Order: Neotaenioglossa				
Family: Caecidae <i>Caecum pulchellum</i>		-	-	-
Family: Calyptaeidae <i>Crepidula fornicate</i>		-	-	-
Family: Neritidae <i>Neritina virginea</i>		-	-	-
Order: Unspecified				
Family: Cylichnidae <i>Cylichnella bidentata</i>		-	-	-
Family: Unspecified Gastropoda (LPIL)		-	-	-
Class: Bivalvia				
Order: Arcoida				
Family: Noetiidae <i>Arcopsis adamsi</i>		-	-	-
Order: Nuculoida				
Family: Nuculanidae <i>Nuculana cocentrica</i>		-	-	-
Order: Veneroida				
Family: Corbulidae <i>Caryocorbula caribaea</i> <i>Caryocorbula</i> sp.		-	-	-



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Family: Solecurtidae		-	-	-
<i>Tagelus divisus</i>		-	-	-
<i>Tagelus</i> sp.		-	-	-
Family: Tellinidae		-	-	-
<i>Angulus versicolor</i>		-	-	-
<i>Macoma cerina</i>	2	-	-	4
<i>Macoma</i> sp.	-	-	-	-
<i>Merisca</i> sp.	-	-	-	-
Tellinidae (LPIL)	2	-	-	2
Family: Veneridae		-	-	-
<i>Anomalocardia cuneimeris</i>	-	-	-	-
<i>Chione cancellata</i>	-	-	-	-
<i>Chione</i> sp	-	-	-	-
Order: Unspecified				
Family: Unspecified				
Bivalvia (LPIL)	6	-	-	16
Total Organisms	43	6	6	66
Total Taxa	6	4	4	6